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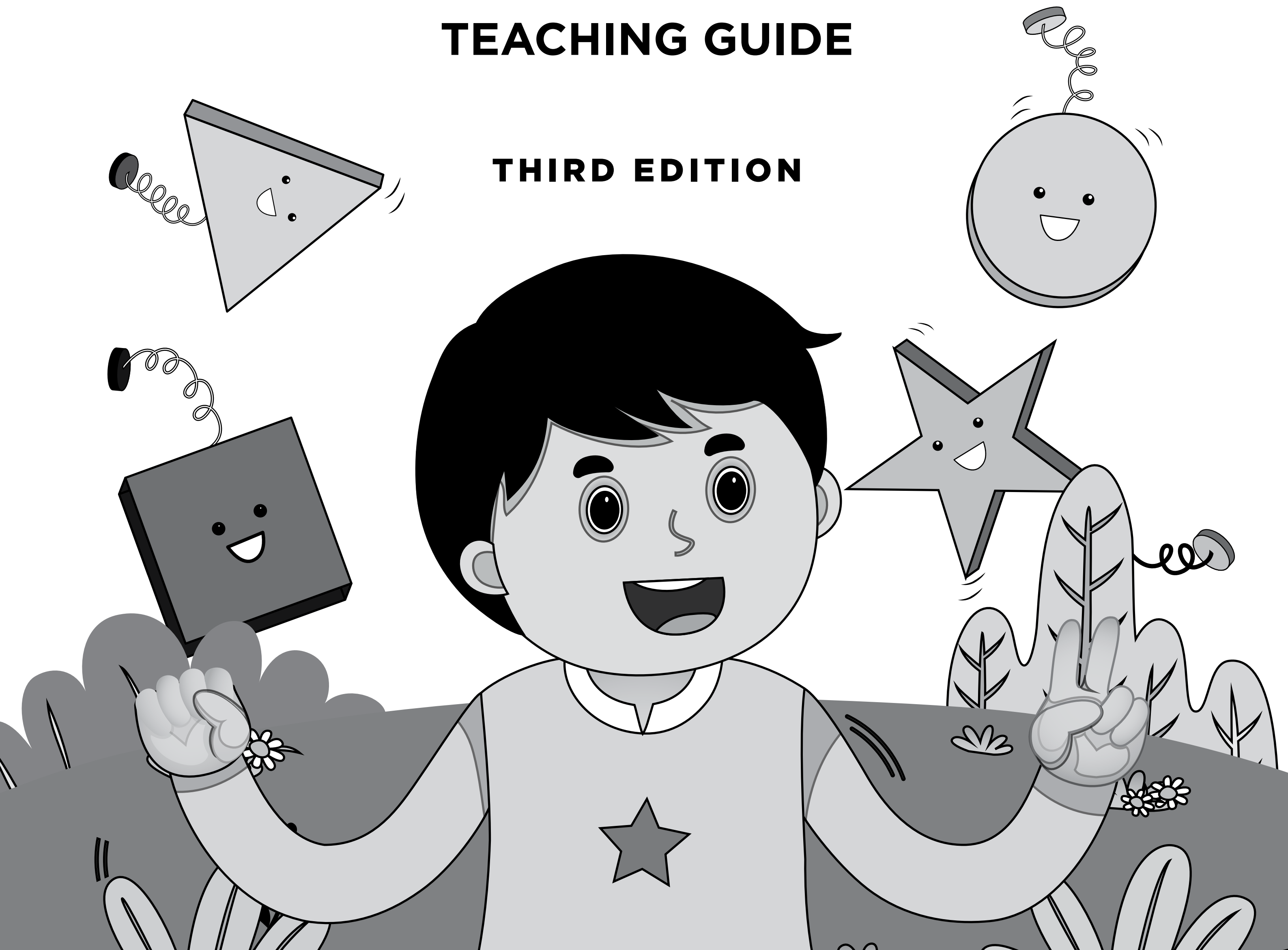
NEW

COUNTDOWN

BOOK 2

TEACHING GUIDE

THIRD EDITION



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Introduction

New Countdown 2 is the fifth book of an eight-book course specially designed for the young mathematician of today's fast-changing world. Building on the foundation established in New Countdown Starter, Primer A, Primer B, and Book 1, it leads students to the confident handling of more advanced operations and concepts: working with 3-digit numbers, the concept of one thousand, addition, subtraction, multiplication, division facts up to 100, time and its measurement, key geometrical concepts, and the idea of fractions.

New Countdown 2 covers all the concepts recommended for Class 2 learners by all major syllabuses; it also reaches beyond them in a systematic and carefully graded way. As in the preceding books of the course, worked examples are provided for every concept introduced, and a range of activities seek to guarantee the interest and involvement of every child.

New Countdown 2 comprises ten units, each containing work which can be covered comfortably in the space of a term. We recommend that you follow the topics in sequence to develop the understanding of the students gradually and smoothly. There is a review section at the end of the book containing practice sheets and the activity sheets.

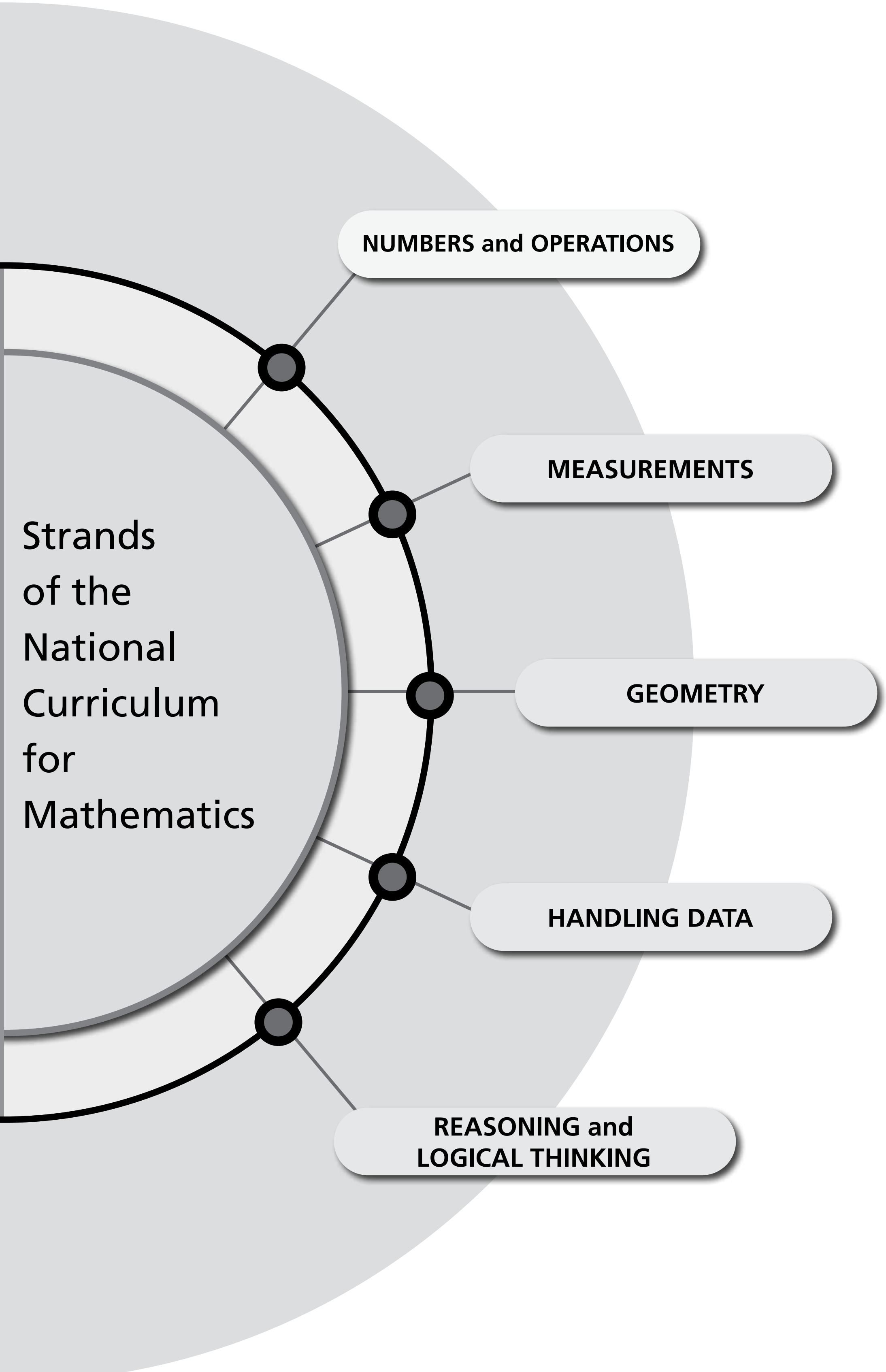
Here are some suggestions for practical work and simple teaching aids which you can incorporate in your lessons. They will reinforce learning and add interest, variety and a practical dimension to your classes.

About the Teaching Guide

The Teaching Guide offers extensive teaching ideas linked with curriculum and adaptable activities to different settings. It provides the strands and benchmarks of the National Curriculum 2006. The strands of the curriculum have been explained in an effective way as a support to teachers' teaching. Activities designed for maximum learning in classroom and daily life are mentioned in each unit. Teachers have the liberty to use any of these or the one mentioned in the model lesson plan or any other activity of their choice depending on the interest of the students and time available.

A syllabus matching grid is also given to facilitate the teacher to connect the students learning objectives with the text in the book. The teaching guide emphasises the development of a positive attitude towards learning maths by enhancing memory retention, building concentration, and creating curiosity for maths. It contains a model lesson plan in each unit to implement time appropriate effective activities.

Shamlu Dudeja


Strands
of the
National
Curriculum
for
Mathematics
NUMBERS and OPERATIONS
MEASUREMENTS
GEOMETRY
HANDLING DATA
REASONING and
LOGICAL THINKING

Syllabus Matching Grid

The left column of the following grid indicates SLOs in National Curriculum, whereas the right column indicates the text book units.

Unit 1: Numbers	
1.1 Numbers i) Write ordinal numbers from first to tenth. ii) Write numbers 1-100 in words.	*covered In Book 1
1.2 Numbers up to 1000 i) Recognise the place value of a 3-digit number. ii) Identify the place value of a specific digit in a 3-digit number. iii) Compare 2 or 3-digit numbers (hundreds, tens and ones). iv) Read numbers up to 999. v) Write numbers up to 999 in numerals. vi) Identify numbers given in ascending or descending order. vii) Count backward ten steps down from any given number. viii) Arrange numbers up to 999, written in mixed form, in increasing or decreasing order. ix) Count and write in 10s. x) Count and write in 100s. xi) Identify the smallest/largest number in a given set of numbers. xii) Recognise that 1000 is one more than 999 and the first 4-digit number.	Unit 1
1.3 Fractions i) Recognise a fraction as equal parts of a whole. ii) Identify half, one third and quarter with the help of objects and figures. iii) Represent half, one third and quarter in numerical form. iv) Shade the equal parts of a given figure to match a given fraction. v) Recognise and name unit fractions up to 1/12. vi) Recognise fractions like two thirds, three fourths, four fifths, and so on.	Unit 6
Unit 2: Number Operations	
2.1 Addition i) Add ones and ones. ii) Add ones and 2-digit numbers with carrying.	Unit 2

iii) Add 2-digit numbers and 2-digit numbers with carrying. iv) Solve real-life problems, involving addition of 2-digit numbers, with carrying. v) Add 3-digit numbers and ones without carrying. vi) Add 3-digit numbers and 2-digit numbers without carrying. vii) Add 3-digit numbers and 3-digit numbers without carrying. viii) Solve real-life problems, involving addition of 3-digit numbers, without carrying. ix) Add 3-digit numbers and ones with carrying of tens and hundreds. x) Add 3-digit numbers and 2-digit numbers with carrying of tens and hundreds. xi) Add 3-digit numbers and 3-digit numbers with carrying of tens and hundreds. xii) Solve real-life problems with carrying of tens and hundreds. xiii) Verify the commutative property with respect to addition.	Unit 2
2.2 Subtraction i) Subtract ones from 2-digit numbers with borrowing. ii) Subtract 2-digit numbers from 2-digit numbers with borrowing. iii) Solve real-life problems of subtraction with borrowing. iv) Subtract ones from 3-digit numbers without borrowing. v) Subtract 2-digit numbers from 3-digit numbers without borrowing. vi) Subtract 3-digit numbers from 3-digit numbers without borrowing. vii) Solve real-life problems of subtraction without borrowing. viii) Subtract ones from 3-digit numbers with borrowing. ix) Subtract 2-digit numbers from 3-digit numbers with borrowing. x) Subtract 3-digit numbers from 3-digit numbers with borrowing xi) Solve real-life problems of subtraction with borrowing. xii) Solve simple problems regarding addition and subtraction with carrying/ borrowing in mixed form.	Unit 3
2.3 Multiplication i) Recognise and use multiplication symbol '×'. ii) Recognise multiplication as repeated addition. iii) Complete number sequences in steps of 2, 3, 4, 5 and 10.	Unit 4

iv) Develop multiplication tables of 2, 3, 4, 5 and 10. v) Multiply numbers within multiplication table. vi) Verify the commutative property of multiplication. vii) Solve real-life problems on multiplication.	Unit 4
2.4 Division i) Recognise and use division symbol (÷). ii) Recognise division as successive subtraction. iii) Divide numbers within the multiplication tables with remainder 0. iv) Solve real-life problems involving division.	Unit 5
2.5 Addition, Subtraction, Multiplication, Division Solve real-life problems involving addition, subtraction, multiplication, and division.	
Unit 3: Measurement of Length Mass and Capacity	
3.1 Measurement of Length i) Recognise the standard units of length, that is metre, centimetre. ii) Read and write standard units of length including abbreviations. iii) Use appropriate units of length to measure objects. iv) Solve real-life problems involving measurements.	Unit 8
3.2 Measurement of Mass and Weight i) Recognise the standard units of mass/ weight, that is kilogram, gram. ii) Read and write standard units of mass/ weight including abbreviations. iii) Use appropriate units to weigh different objects. vi) Solve real-life problems involving mass/ weight.	
3.3 Measurement of Capacity i) Recognise and use the standard unit of capacity/ volume, that is litre. ii) Read and write standard units of capacity/ volume including abbreviations. iii) Use appropriate units of capacity to compare capacity of different objects. iv) Solve real-life problems involving capacity/ volume.	

Unit 4: Time	
4.1 Time i) Know the number of hours in a day and number of minutes in an hour. ii) Read and write the time from a clock in hours and minutes (with five minute intervals). iii) Recognise a.m. and p.m. iv) Draw hands of a clock to show time in hours and minutes (with five minute intervals). v) Use solar calendar to find a particular date. vi) Use lunar calendar to find a particular date.	Unit 9
Unit 5: Geometry	
5.1 Two-dimensional Figures i) Identify square, rectangle, triangle, circle, semi-circle, and quarter-circle. ii) Identify vertices and sides of a triangle, rectangle, and square.	Unit 10
5.2 Lines and Curves i) Differentiate between a straight line and a curved line. ii) Identify straight and curved lines from given line drawings. iii) Use straightedge/ ruler to draw a straight line of given length.	

Teaching Mathematics at Primary Level

Teaching Strands

The Strands of Mathematics represent the main domains of learning in mathematics. The three strands of the Primary Mathematics Curriculum taught at this level are Numbers, Measurement, and Geometry while Data Handling will be covered later. However, reasoning and logical thinking skills are embedded in every strand. Learning mathematical skills provides the opportunities for developing reasoning skills and consequently logical thinking.

Solving word problems, distinguishing 2D and 3D shapes, positioning of objects, budgeting, and measuring objects help students in decision-making, hence developing reasoning skills and logical thinking.

To teach maths at primary level, the teacher should use multiple teaching methods to maximise students' learning. Maths activities such as counting, sorting, organising, and pattern-making etc. are a source of engaging students in their learning. The knowledge of maths at the primary level may forecast the achievements of math skills in the future.

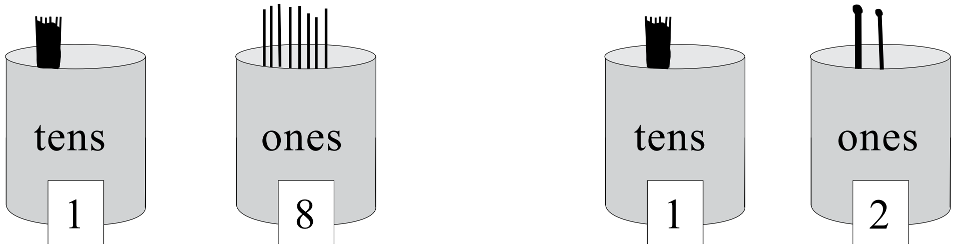
Materials which give hands-on experiences such as solid shapes, abacus, clocks, place value blocks, number lines, the place value chart, and play money should be provided to students to make connections to their learning.

It is essential to check that each student has mastered the topics previously taught and is confident about handling them before proceeding to teach new topics. Review activity relating to place value needs special emphasis.

Numbers and the Four Operations

Make use of matchsticks (or straws, pencils or lollipop sticks) for tens and ones recommended in New Countdown 1 as well as place-value cards. Your place-value cards should now cover the entire span of numbers from 1 to 100, and you may also want to prepare a longer card to show 1000. Perhaps the most useful teaching aids for Class 2 learners are tens and ones tins. You will find that presenting the concept of changing place values is made much simpler through the use of these tens and ones tins. Each student is given (or brings from home) two old tins or plastic tumblers. One tin is labelled as 'tens' and the other as 'ones'. To use the tins, each student must have access to matchsticks or straws bundled into tens, and also to loose sticks. He/she must also have at least two/three sets of numeral cards from 0 to 9 readily available.

When you start working on addition converting ones, ask the students to work in pairs. For example, the first student shows the number 18 by putting one bundle of ten sticks in his/her tens tin and 8 loose sticks in his/her ones tin. He then places the correct numeral card against each.



The second student shows the number 12 in the same way. The two students then find out how many sticks there are altogether by putting the bundles of ten into one of the tens tins, and the single sticks into one of the ones tins. They will discover that they have 10 sticks in the ones tin. Discuss this carefully, making sure the students understand why they must tie the sticks together and place that bundle in the tens tin.

They now find they have three bundles of sticks in the tens tin and zero sticks in the ones tin. Now repeat the activity, at each stage noting on the board what the students are doing.

First, show the addition to be done:

tens	ones
1	8
+ 1	2

Now add the ones (single sticks).

Use a dotted line or coloured chalk to show the '10' in the ones column.

tens	ones
1	8
+ 1	2
	10

As the students tie their 10 sticks in the ones tin together and place them in the tens tin, explain that we show the transferred or changed ones by writing a '1' in the tens column.

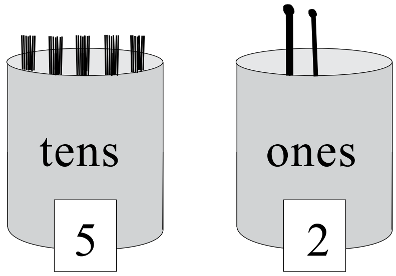
tens	ones
$\overset{1}{1}$	8
+ 1	2
3	0

This activity can be extended to cover the addition of ones where the sum is greater than 10. By adding a third, 'hundreds' tin, you can utilise the activity also for 3-digit addition with changing place value.

When introducing subtraction with borrowing ask each student to place three bundles of sticks in the tens tin leaving the ones tin empty. Now ask him/her to remove five of the sticks and see how many are left. As he/she does the operation note the steps on the board.

tens	ones
$\overset{2}{\cancel{3}}$	$\overset{10}{0}$
−	5
2	5

First, the student discovers that he/she has to open one of the bundles in the tens tin in order to take out 5 sticks. Explain to the student how he/she can record exactly what he/she did. First, he/she took out one of the tens bundles. Three bundles therefore, became two. Next, the tens bundle was changed into 10 ones to be able to subtract the ones and get the right answer. This activity can be repeated when you come to the concept of subtraction of tens and ones from tens and ones. For example, the students are asked to subtract 27 from 52.



They first remove one bundle of ten and untie it to get 10 single sticks.

tens	ones
$\overset{4}{\not 5}$	$\overset{10}{2}$
− 2	7
	5

They add the 10 sticks to 2 already in the ones tin, making 12.

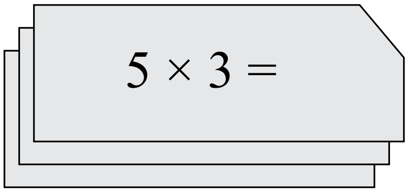
tens	ones
$\overset{4}{\not 5}$	$\overset{10}{2}$
− 2	7
2	5

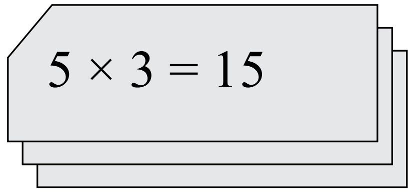
Now they can subtract the ones (12 – 7 = 5). After taking away the tens (4 – 2 = 2) they get the answer as 25 sticks.

Make sure your students understand the importance of neat and systematic work when converting from ones to tens and vice-versa. Explain that if they fail to write their conversions clearly and in the correct column, they will make mistakes.

The multiplication and division facts, begun in New Countdown 1, are completed. It is essential for students to master these facts and have them on their fingertips as they proceed to advanced multiplication work. Games, puzzles, pattern-seeking and regular use of the multiplication square will help. Make sure that every student grasps the fact that when a zero occurs in a multiplication the result is always zero.

Flashcards are a simple and practical way of helping students learn their multiplication and division facts and understand their interrelatedness.





On the front, write an incomplete fact, supplying the completed fact on the reverse. You can use the cards for general class work (team games, quizzes, etc.) or ask the students to work in pairs: here, one student flashes the card at his/her partner, checking his answer by looking at the back.

Encourage your students to look for patterns in the number facts they are learning. For example, in multiples of 9 the sum of the digits is always 9 (18 = 1 + 8 = 9, 27 = 2 + 7 = 9, and so on). In multiples of 5 the ones part of the answer is always either 0 or 5.

For multiplication using place value where multiplications outside the known facts are involved (refer to page 76), make use of your tens and ones tins. Ask three students to arrange 14 sticks each in their pairs of tins. What happens when all the sticks are put together in another pair of tins? Most students will say that there are 3 tens and 12 ones. Help them to see why they must change the 12 ones into one bundle of tens and two ones, transferring the newly made bundle of ten to the tens tin. Repeat the operation, noting down each stage on the board. The students will see that this is a rather cumbersome way of recording their action.

T	O	
1	4	
×	3	
1	2	(4 × 3)
3	0	(10 × 3)
4	2	(14 × 3)

Now proceed to explain how we simplify the recording of the sum by writing our changed ones as one ten in the tens column.

Students learn division through sharing and repeated subtraction. They increase their vocabulary through conversation. They are made familiar with terms, such as ‘share equally’, ‘subtract repeatedly’, ‘take away equally again and again’ and ‘you are left with less’.

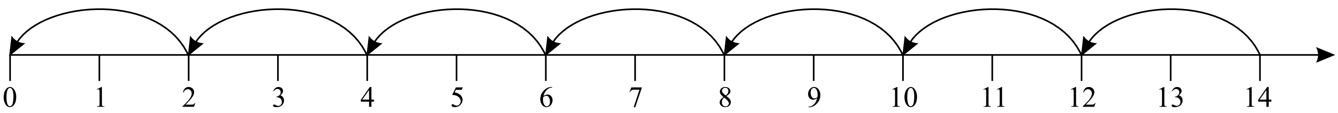
Folding paper with dots is also an interesting activity. Here, a student is given a strip of paper with dots at regular intervals. First the student counts the dots (say 15 dots) and then folds the paper after every 3 dots. Finally, he counts the number of folds to see how many sets of 3 make 15.

• • •   • • •   • • •   • • •   • • •

After much practical experience the students are introduced to the symbol ‘÷’.

Many examples of division sums are then worked out so that students understand and grasp the link between everyday activity and the operation required. For example, there are 21 sweets and each student gets 3 sweets. How many students can share the sweets?

Page 78, 79, and 83 help the students understand that division is the opposite (reverse) of multiplication. Then, students divide the numbers in groups so that there is 0 remainder, using Bobo jumping back from a certain number on the number line as on page 81. Bobo starts at 14, takes jumps of 2. How many jumps does he take before he reaches 0?



Terms, such as dividend, divisor, and quotient are to be taught and have to be used to make the students familiar with them. Here students solve problems with no remainder.

The concept of fraction (page 91-100) offers you plenty of scope for practical activities. Make sure all the students fold sheets or strips of paper to make halves. Let them cut along the folded line, then hold up each piece in turn and tell the class 'This is one half of my paper'. Then ask them to hold up both pieces together saying 'Two halves make a whole'. Now introduce notation asking the students to write on each of the two halves of their sheet. Repeat this activity when you introduce the concept of quarters (Page 95). By holding up two quarters students will instantly see how the half of the strip is divided into quarters by cutting halves along the centre folded line.

Measurement

The sections on length, weight and capacity set out a number of key correlations involving 1000. After establishing that 1 km = 1000 m, these sections point out that other measures, too, can be divided into 1000 parts. Simple number facts relating to 1000 are then presented (pages 112 –116; 120 –122; 129). You might like to devise your own flashcards to reinforce these useful number facts. Students are also introduced to the idea of working with two units of measurement simultaneously—for example, metres and centimetres, kg and g, and so on. Simple addition and subtraction exercises involving no carry over from the smaller unit to the bigger unit or vice-versa are included; make sure your students feel confident working with these more complicated-looking sums.

The concept of time is something all students enjoy discussing. You can talk about birthdays, holidays, grandparents' days, and when they were born, last year and next year, last week and next week, or even being late for school. As you proceed to clock work (Page 133-145) make your own classroom display clock, with adjustable hands. Make your clock out of thick cardboard attaching the hour hand and minute hands with a paper fastener or drawing pin so that the hands can be moved. Make sure there is a big difference in the length of the two hands.

Organise team games around the problem of showing what 'o'clock' it is. Develop the idea of thinking of one hour earlier or one hour later, asking the students to show the time on the clock face. Use your cardboard clock to demonstrate half past the hour. Ensure that the students understand that they must move the short hand as well as the long hand.

The same point applies to currency notes introduced on (pages 101–102). Make sure you have a specimen of each note to show the students enabling them to compare sizes, colours and designs. The shopping exercise on (page 106) is one you can easily develop in your

classroom. Arrange a display of simple items with price labels attached. Select a group of students and allocate them money—simple currency notes made of paper or cardboard, or actual coins. Ask them to buy what they want and work out their spending sums. Extend your shop work to cover multiplication and division, for example, ask 'if lollipops cost Rs 4 each, how much will six lollipops cost? If 4 students have Rs 20 to spend, how many lollipops can they buy?

Geometry

When discussing the geometrical terms introduced on (pages 153–160), it is essential for you to have real-life examples of each solid shape ready in the classroom, suggestions are made in the text.

Encourage your students in handling the shapes and discover through actual experience how many faces, edges and vertices they have, and whether their faces are curved or plane surfaces.

Developing a Positive Attitude Towards Mathematics

Students are born with a mind which is thinking, receptive and ready to try out new things, so they have a vast potential to grow. The two most essential aspects for this growth are the two Rs, i.e. reading and (w)riting, and both of them are dependent on each other.

The primary objective of the New Countdown series is to ensure that every student develops a strong affinity towards mathematics. For this, the following things are necessary:

- Concentration
- A sense of fun
- Retentive memory
- Asking questions and giving answers with confidence
- A sense of discovery and learning (rather than 'being taught')
- Understanding of the subject in a creative, logical and lateral manner
- Individual, easy pace of learning for each student
- A sense of confidence
- A sense of being supported by the teacher

Teachers need to take the age group of the students into consideration and help them learn in a manner suitable to their age.

The first four years in school aided by Starter, Primer A, Primer B and Book 1 of New Countdown have been very useful in exposing students to new things and new ideas in mathematics. At the end of these four years, their power of grasping new topics has improved, they are familiar with the beginnings of the two Rs, and they are ready to accept a lot more.

Building Concentration

A student cannot perform well in the classroom if s/he is not attentive, distracted, or facing difficulty in focusing on the work on hand. Concentration or attention enhances students' understanding and retention. Mostly students will concentrate on fun activities, but it is crucially important to concentrate on all kinds of tasks done in the classroom to improve learning and build confidence. Given below are some strategies to enhance the concentration span in the classroom.

- Set an appropriate amount of time to complete the task. This may bind a student to focus on the given task so that he\she could complete it within time limits.
- Divide big task into parts. As shorter amount of time and one task at a time may become an easier job for the students. A big task requires a longer time and more concentration and focus that may become a reason for distraction.
- Give them enough physical activity to avoid restlessness and make it easier to focus on the task.
- Allow some free time before beginning a new task.
- Reinforce positive behaviour.
- Introduce a reward system by praising the students or allowing them time to read their favourite book.

Some games may be helpful to increase concentration span:

- Just Sit: This game is played by challenging the students to sit in their chairs without moving to see how long they can do it.
- Statue: The teacher says 'statue' and everyone will be still in whatever position they are, for a few minutes.

Like any skill concentration can be built and improved with consistency.

Memory Retention and Fun

All learning needs to start with practical activities. This makes learning enjoyable and fun-filled. Such an approach also goes a long way to aid memory retention. Rote learning, at most uses two senses—listening and seeing (reading), whereas activities which involve touching create a sense of joy or pleasure at discovering new things, which is missing in rote learning, is a great accelerator for learning.

The greater the number of senses used during a learning exercise, the better will be the concentration and subsequent understanding, retention and application. The joy that students derive out of such a learning experience would be an added bonus.

Formal textbook learning leads to vertical learning, such as 2 + 1 = 3, therefore 3 + 1 = 4 and so on.

Nowadays, it is important that students think, learn and apply their knowledge laterally, i.e. they are actually able to apply the concepts learnt by them to their environment throughout the day.

Any aspect of learning done with concentration will lead to retention and the use of memory can never be undermined.

Discovering, Learning and Understanding the Concept

Students learn something new every minute as they discover. Each discovery is a result of a practical activity and without practical activity a proper grasp of the subject is not possible.

A student may recite a poem-like 1 + 1 = 2, 1 + 2 = 3, and so on. But, unless these numbers are connected to the physical world by presenting the above sums as, say, '1 marble put together with 1 more marble gives 2 marbles' and '2 marbles put together with 1 more marble gives 3 marbles', the entire number sequence makes little sense.

After a start like this, the student's sense of curiosity will be heightened and will remain with him/her throughout life, lending it a dimension that many adults have never experienced.

Lateral Thinking

In today's times, more than ever before, it is important that students think, learn to think and apply their knowledge laterally, i.e. they apply what is actually learnt from the books in the classroom to their environment throughout the day in their every-day life. For example, number families, such as 1, 2 and 3; 2 + 1 = 3, and 3 – 1 = 2 or 3 – 2 = 1, are not only learnt for the classroom but to apply in their daily life as:

'I need 3 books to give as a gift to my friends. I have 2 books at home. So I need to buy 1 book (3 – 2) more.'

From New Countdown series students may learn 1st, 2nd, 3rd…up to 10th, but if the lesson has been creatively handled when a situation arises involving 20 students in a line a student with a developed lateral power of thinking will apply 11th, 12th, 13th, and so on automatically. So, observation and vocabulary improve, leading to a major jump in learning.

Asking Questions and Giving Answers

The mother of a well-known intellectual said that the reason for her son's brilliant performance in life was that he always asked too many questions and gave answers, even when he was not asked. Can one say more? A good teacher is the one who encourages students to ask questions and give answers and also gives them a chance to find solutions to different situations whenever possible.

Pace of Learning

Every child learns at a different pace. They do their work at a pace which is comfortable for them. Letting students do at their own pace may affect the unified progression of lessons for all the students in the class. The following strategies can be considered to manage the pace of learning:

- Use a timer in the class. Ask students a question, give sufficient wait and think time. Set the timer and tell the students that as the bell rings, the think time will be over and they will have to give the answer.

- Make clear goals. The students should clearly know what they are going to learn.
- Materials should be ready beforehand.
- Take out time and see where your students are during the lesson. Students enjoy pairing and sharing.
- Break the activity after five to seven minutes, and allow a few minutes to talk and share the information with their partner.
- Use non-verbal quickies like thumbs up and thumbs down to assess if more time is needed.

Building Self-confidence

Being in a familiar and friendly environment itself is a confidence-building exercise. The more relaxed and confident a student is, the easier it is for him or her to absorb new concepts as the year progresses.

Bonding with the Teacher

Students are born with a mind which is thinking, receptive, and ready to try out new things, so they have a vast potential to grow if handled properly by the teacher. A happy and fun-filled atmosphere, which the teacher creates, leads to a greater bonding between the students and the teacher. This is very important at the primary levels and should never be ignored. A comfortable, tension-free atmosphere leads to healthier mental growth. What else could be a better reward for a teacher than a class full of happy and confident students?

Features of the Teaching Guide

The Teaching Guide contains the following features.

Suggested Time Frame

The guide provides a suggested time frame for the whole unit. However, every lesson is important in shaping the behavioural and learning patterns of the students. The teacher has the discretion to either extend or shorten the time frame as required.

Learning Curve

This orients you in the direction the current lesson should take. It helps you to base the lesson on specific understanding and skills that the students have learnt in previous lessons. It indicates the extent to which the new lesson content must be established in order to serve as the foundation for more complex concepts and skills. The initial question when planning a lesson should be how much do the students already know about the topic? If it is an introductory lesson, a different approach is to be adopted. You can start with an interesting story, use resources, or ask questions which will lead to the new topic.

Real-life Application

Today's students are very proactive. The study of any topic, if not related to practical real-life, will not excite them. Their interest can easily be stimulated if we relate the topic at hand to real-life experiences.

Frequently Made Mistakes

It is important to be aware of students' common misunderstandings of certain concepts. If the teacher is aware of these they can be easily rectified during the lessons. Such misconceptions are mentioned to support teachers.

Summary of Key Facts

Facts and rules mentioned in the text are listed for quick reference.

Model Lesson Plan

Planning your work and then implementing your plan are the building blocks of teaching.

Teachers adopt different teaching methods/approaches to a topic.

A model lesson plan is provided in every unit as a preliminary structure that can be followed. A topic is selected and a lesson plan is written under the following headings:

Topic

This is the main topic.

Duration

Duration is the number of periods required to cover the topic. Generally, class dynamics vary from year to year, so flexibility is important. The teacher should draw his/her own parameters, adjusting the teaching time depending on the receptivity of the class to that topic. Note that introduction to a new topic takes longer, but familiar topics tend to take less time.

Specific Learning Objectives

This identifies the specific learning objective/s of the topic being taught in that particular lesson.

Key Vocabulary

List of mathematical words and terms related to the topic that may need to be pre-taught.

Resources

This section includes everyday objects and models, exercises given in the chapter, worksheets, assignments, and projects.

Strategy

Starter: Engagement Activity

The lesson can begin with something interesting, such as telling a story, relating a real-life experience or an everyday event which may or may not lead to the topic; but is interesting enough to capture the attention of the students. Involving students in a discussion to find out how much knowledge they have of the topic being taught is also a good strategy. Teachers can use their own creativity to come up with ideas to create a sense of fun.

Main Developmental Activity

Learning needs to start with practical activities. Therefore, the main developmental activity is the first step that leads to actual learning, which in turn leads to the required outcome of the lesson. This activity can be planned as individual work, pair or group work as required. Working individually creates self-confidence where a student enjoys a sense of self-achievement, whereas pair and group activities create a sense of discovering and learning together.

These activities enhance concentration and improve memory. Through these activities, a teacher can build understanding of concepts in a fun-filled way. It is easier for students to grasp the concepts and then move from abstract to concrete.

Written Assignments

Finally, written assignments can be given for practice. It should be noted that classwork should comprise of sums of all levels of difficulty, and once the teacher is sure that students are capable of independent work, homework should be handed out. For continuity, alternate sums from the exercises may be done as classwork and homework.

Supplementary Work (Optional): An activity or assignment could be given. It could involve group work or individual research to complement and build on what students have already learnt in class. The students will do the work at home and may present their findings in class.

Wrap up

At the end of each topic a wrap up should be done using various strategies. For example, a quick question and answer session involving the whole class. Challenging students with a question to check their understanding of the concept taught is a good strategy.

Suggested Activities

Activities and assignments are suggested to perform individually, in pairs, and in groups.

Flash cards based on the concept being taught will have more impact.

1 Numbers

Suggested Time Frame

10 to 12 periods

Learning Curve

Previously students have been working with numbers up to 99. They know hundred rupees and have seen a hundred rupee note. Hundred has to be introduced as addition of 1 to 99 following the same pattern as in 10, addition of 1 to 9. Then, they learn to work with 3-digit numbers.

Real-life Application

Numbers play an important role in our daily life. They are directly or indirectly connected to our daily routine. We find numbers involved in:

- home address
- phone numbers
- telling time
- measuring objects
- cooking
- prices and discounts
- number of peoples in a gathering
- profit and loss in the business
- paying bills

Frequently Made Mistakes

- Confusion in putting the sign of greater than and smaller than correctly.
- Wrong placement of numbers in the place value chart.

Summary of Key Facts

3-digit numbers are greater than 2-digit numbers.

Comparison and ordering of numbers depends upon the place values of the digits.

Model Lesson Plan

Topic

Comparing and ordering 3-digit numbers.

Duration

80 minutes

Specific Learning Objective

By the end of the lesson students will be able to compare 3-digit numbers using the terms 'greater than' and 'smaller than', using symbols (> or <), and arrange a set of numbers in ascending and descending order.

Key Vocabulary

ascending, descending, greater than, smaller than, order, and place value.

Resources

White board, a place value chart with H, T, and O.

Strategy

Engagement Activity (10 minutes)

Show them two 3-digit numbers on the board, ask them which number is greater and how they know.

Main Developmental Activity (25 minutes)

Stick the place value chart having H, T, and O columns, in one corner of the board. Review the topic of place value to hundreds. Write a 3-digit number in the place value chart. Ask the value of each digit.

Revise comparing 2-digit numbers by writing two 2-digit numbers, 43, and 63, on the board. Involving the students, compare digits in the tens place. If they are equal, move to the ones place and decide which of the numbers is greater. Ask them to answer with the appropriate term i.e. using greater than or smaller than. Then ask them to put the appropriate sign (> or <) between the numbers.

Now explain that the same method is applied to comparing 3-digit numbers. Write two 3-digit numbers in the place value chart. Starting from the hundreds place they will compare the digits in each place value and decide which one is greater. Then they will decide the appropriate sign (> or <). If they are confused with the signs, recall the idea that the open mouth of a hungry crocodile always moves towards the greater number.

Using their learning of comparing 3-digit numbers, they can consequently arrange a set of numbers in ascending and descending order.

Written Assignment (25 minutes)

Practice sums on page 18, 19, and 20 can be given to solve as classwork and homework.

Wrap up (10 minutes)

Write two sums of comparing 3-digit numbers on the board. Ask the students to solve them on their white boards and hold them up to show the answers.

Write three numbers on the board and ask them to arrange in descending order. Again, they will solve the sum on their white board and show the answer to the teacher.

Suggested Activities

Some activities related to the topic are suggested below. The teacher can select any which are suitable for the lesson plan to enhance the teaching/ learning process in the classroom.

Starter Activities

Individual Activity (10 minutes)

Prepare the list of random numbers on a piece of paper e.g. 504, 670, 488 etc. and give this list to the students. Ask the students to write H, T and O on a paper and partition these numbers under the correct places.

Individual Activity (10 minutes)

On the board, draw a wall of 100-bricks. Not all 100 numbers are written on the bricks. Two students at a time pick up paper bricks (cards shaped like bricks with numbers on them) and put them in the right place.

Whole Class Activity (8 minutes)

Hide the random spelling cards of different numbers e.g. 112, 764, 818, 45, 130 etc. in the classroom. Call out the number and ask students to find the number spelling of the called number. Do the activity the other way as well. Show a spelling card to the students, ask them to see the spelling and find the relevant number.

Whole Class Activity (10 minutes)

Recall the concept of greater numbers with the help of counters. Keep a smaller quantity of counters on one side and a greater quantity on the other side. Let students count and tell about the greater/ lesser quantity. Also introduce the crocodile’s mouth for greater numbers.

Use place value to compare the two numbers. If the two numbers have different digits in the tens place then compare to find the greater number. Give another number, the digit in the tens place is the same. Both numbers have 5 sets of 10. So, the tens place will not help when comparing the two numbers. If the two 2-digit numbers have the same digit in the tens place, then you need to move on and compare the digits in the ones place. The number with the larger digit in the ones place is the bigger number. The number with the smaller digit in the ones place is the smaller number.

Call out numbers for students writing their responses on the white board/ paper. After calling out three numbers, ask students to order them either from smallest to greatest or greatest to smallest. Challenge students to explain how they know they are correct.

Group Activity (10 minutes)

Chit Game - Prepare chits with any one number written on each chit. Fold all chits and put them in a basket. Let students sit in a circle and sing a song and as you sing the students can pass the basket around the circle as they sing along with you. When you stop, the student holding the basket will pick up a chit, open it and let others know which number is written on the chit. The teacher will now ask the same student to tell which number comes before/ after.

Note: The same game can be played for 'between numbers'. Different chits are to be prepared for it e.g 202 __ 204 etc.

Whole Class Activity (5 minutes)

Make two columns on the board naming them as O and T. Call out any number (54, 73, 42 etc.) for students to partition into tens and ones, writing their responses on the white board, in the correct column.

Make a Place Value House out of a shoe box with partitions to show two rooms (T-O rooms) and share the information that only one digit can be accommodated in one room. If the number 50 is shown, then how will they place this number in the place value house. 5 will go in room 'T', 0 will go in room 'O'. 5 in T room means 5 tens. They understand zero as a place holder. Give them a lot of practice with this box and number cards, giving different combinations each time.

Individual Activity (10 minutes)

Provide slates/ papers to the students. Call out random numbers and let each student write the spellings of the called numbers independently. Call 4 to 6 numbers, once you are done, write the spellings of the called numbers on the board and let students do self-assessment by checking and tallying if they have written all numbers correctly or not.

Main Developmental Activities

Individual Activity (8 minutes)

Provide different laminated templates to the students to practise before/ after/ between/ greater/ lesser and ordering 2-digit numbers. Refer to pages 2 to 3 of Countdown Book 2 for making the templates. Let them work on those templates as and when they get the time.

Small Group Activity (10 minutes)

Make groups of three students. Prepare the lists of random numbers on a piece of paper e.g. 45, 76, 84 etc. and give one list to each group along with the place value chart and number cards. Ask the students to take turns and arrange the number cards in the place value chart. Let other students of the group check the number once the student has made it. Give at least 1 turn to each student.

Whole Class Activity (8 minutes)

Hide the random spelling cards of different numbers e.g. 11, 76, 88, 45, 30 etc. in the classroom. Call out the number and ask students to find the number spelling of the called number in the classroom. Do the activity the other way as well. Show a spelling card to the students, ask them to see the spelling and find the relevant number.

Small Group Activity (10 minutes)

Divide the class into three to four groups. Provide each group with a the list of random numbers on a piece of paper e.g. 45, 76, 84 etc. Also provide a blank sheet of paper to them. Ask students to take turns and each student to write the spelling of one number in the list on that blank sheet of paper. Each group will show the spellings sheet to the teacher. The group who will write all spellings correctly in the least time will be the winner.

Individual Activity (8 minutes)

Provide papers to the students or ask them to take out their white boards. Call out random numbers and let each student write the spellings of the called numbers independently. Call 6 to 8 numbers, once you are done, write the spellings of the called numbers on the board and let students check if they have written all numbers correctly (self-assessment).

Individual Activity (10 minutes)

Provide different laminated templates to the students to practice before/ after/ between/ greater/ lesser and ordering 3-digit numbers. Refer to page numbers 16 to 21 of Countdown Book 2 for making the templates. Let them work on those templates as and when they get the time.

Whole Class Activity (15 minutes)

Give each students a card with a single number on it. Call three students to the front of the class. Ask them to stand next to each other showing their number cards. Call another student to read the number showing on the three cards held by the three students. Suppose the numbers are 5, 3, and 2. Student should say, Five hundred thirty two. Then ask students to tell you who is in the hundreds place, who is in the tens place, and who is in the ones place. Repeat until whole class takes part in the activity.

Small Group Activity (10 minutes)

Prepare a list of random numbers on a piece of paper e.g. 145, 764, 814 etc. and give this list to the students along with the Place Value House and number cards. Ask the students to take turns and arrange/ make the number in the Place Value House. Let other students of the group check the number once the student has made it. Give at least 1 turn to each student.

2 Addition

Suggested Time Frame

6 Periods

Learning Curve

Students know how to add numbers in the Tens column and Ones column using the abacus and the number line. They now review addition of one-digit numbers and later 2-digit numbers without carrying over. Word problems are also given to make learning relevant and the students learn and apply in everyday life situations. This makes the study fun and interesting.

Once this is clear, students add 3-digit numbers with 3-digit numbers without carrying over. Next, they learn addition with carry over i.e., the students learn how to group ones into 10, then tens into 100s.

Real-life Application

Addition is a basic operation applied in all aspects of life. We use addition for buying, selling, cooking, measuring, and many other things.

Frequently Made Mistakes

- Numbers not written in correct places.
- Confusions in borrowing and carrying forward.
- Not regrouping the numbers correctly.

Summary of Key Facts

- Addition of numbers is commutative.
- Zero added to zero results in zero.
- Zero added to a number does not change the number.
- Any number added to itself is the same as doubling the number.

Model Lesson Plan

Topic

Addition of 3-digit numbers with carrying.

Duration

40 minutes

Specific Learning Objective

The students will be able to add two 3-digit numbers with carrying and without carry forward.

Key Vocabulary

2-digit, 3-digit, carry, and carry forward.

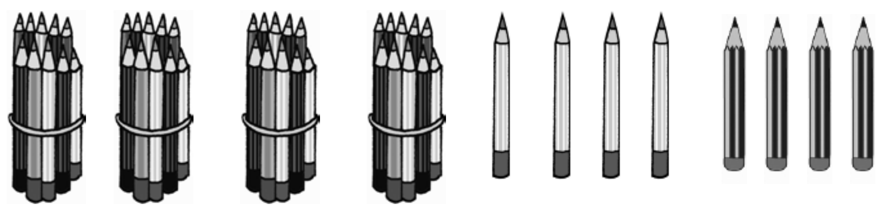
Resources

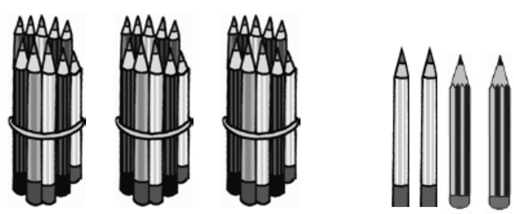
Bundles of ten pencils and a few loose pencils, cards having different numbers of stars.

Strategy

Engagement Activity (5 minutes)

Tell the students they have 4 bundles of 10 pencils and 8 loose pencils and I have 3 bundles of 10 pencils and 4 loose pencils. How many pencils altogether?

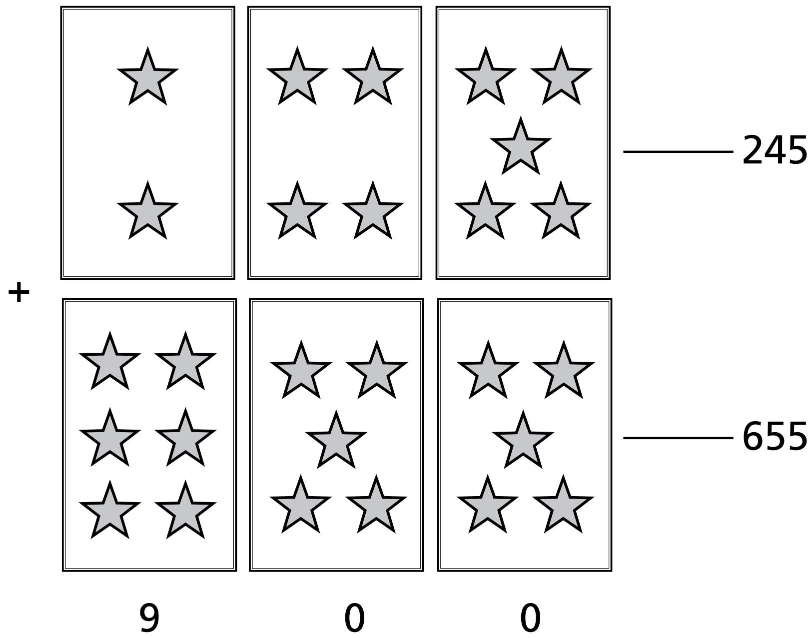




$$\begin{array}{rcc} & T & O \\ & \overset{1}{4} & 8 \\ + & 3 & 4 \\ \hline & 8 & 2 \\ \hline \end{array}$$

Main Developmental Activity (25 minutes)

Instead of solving 3-digit addition problems directly in the notebooks, solve the sums through an activity using star card. Group the students in pairs. Considering that they have already done the addition of 2-digit numbers with/without carrying forward, ask each pair to draw 6 cards. They will make two 3-digit numbers from the cards as shown opposite.



Students will add the numbers and write their answers below the two lines of cards

Written Assignment

Page 33 and 34 can be given for practice.

Wrap Up

Ask the students who got the highest sum of the two 3-digit numbers?

Suggested Activities

Addition of 2 Digit Numbers

Main Developmental Activity

Whole Class Activity (10 minutes)

Write a vertical sum on the board carrying such numbers that lead to conversion of ones after addition e.g. 58 and 24. Let students use mental maths to add the numbers in ones i.e. 8 and 4. Ask them to give you the answer i.e. 12. Ask them if they have any idea what to do with this 2-digit number. Let them focus on the fact that it’s a 2-digit number and carries a ten in it. Therefore, we cannot write it in the ones column. Ask them the number of tens in this 2-digit number i.e. 1. Guide them to take/ carry this 1 ten in the tens column writing 1 above 5 and 2, write 2 in the ones column. Now ask them to add 5, 2 and 1 in the tens column and get their answer (8 tens). Give them a lot of practice on the board of such sums.

	T	O
	1	
	5	8
+	2	4
	8	2

Small Group Activity (10 minutes)

Prepare lots of laminated templates of different types and keep them in the classroom for students to practice different addition sums using board markers. Refer to pages of Countdown Book 2 to make different types of templates. Let students practice using these templates in pairs or small groups.

Individual Activity (10 minutes)

Give a lot of individual practice to the students for solving addition sums using the laminated templates (same templates which were used in small group activities) of different types, as and when they get the time.

Whole Class Activity (10 minutes)

Write a vertical sum on the board carrying such numbers that lead to conversion of ones after addition e.g. 123 and 148. Let students use mental maths to add the numbers in the ones i.e. 8 and 3. Ask them to give you the answer i.e. 11. As they have practiced this concept in 2 digit numbers they have the idea that it's a 2-digit number and carries a ten in it. Ask them to take/ carry this 1 ten in the tens column writing 1 above 2 and 4 and write 1 in the ones column. Now ask them to add 2, 4 and 1 in the tens column and get their answer i.e. 7 tens. Also let them add the numbers in the hundreds column i.e. 1 and 1. The answer is 271. Give them a lot of practice on the board of such sums.

3 Subtraction

Suggested Time Frame

6 to 8 periods

Learning Curve

Students have already learnt to subtract Tens and Ones using the abacus and the number line. They have learnt to subtract two 2-digit numbers. They are able to find the unknown by completing the equations such as ---+4=7

Now they will learn to group ones into 10, then tens into 100s. They will be able to subtract two 3-digit numbers with/ without borrowing.

Real-life Application

The method of subtraction is applied to billing, purchasing, dividing, and handling money etc.

Frequently Made Mistakes

- Writing numbers incorrectly.
- Writing wrong numbers as a result of carelessness.

Summary of Key Facts

- Symbol used for subtraction and equality are – and = respectively.
- Subtraction can be performed on a number line.
- Subtraction equations can be constructed to find the difference or missing number in the subtraction sum.
- Numbers are not commutative with respect to subtraction.

Model Lesson Plan

Topic

Subtraction.

Duration

80 minutes

Specific Learning Objective

By the end of the lesson, students will be able to perform subtraction of two 3-digit numbers with borrowing.

Key Vocabulary

subtract, take away, less, minus, left over, and take out etc.

Resource

Bundles of ten pencils and a few loose pencils, cards having different numbers of stars.

Strategy

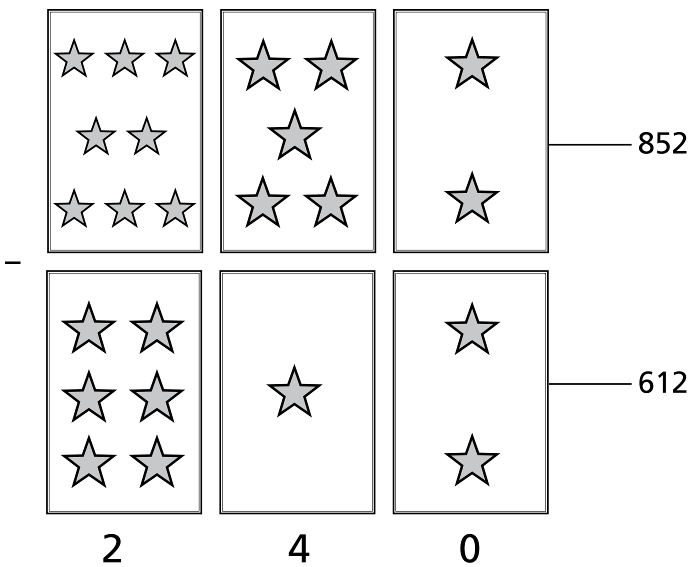
Engagement Activity (10 minutes)

Tell the students that they have 4 bundles of 10 pencils and 8 loose pencils. They need to give away 2 bundles of 10 pencils and 9 loose pencils to a friend, Ahad. How many pencils are left over?

Start from single pencils, 9 pencils cannot be given away from 8. So, one bundle of 10 pencils needs to be opened and 8 pencils can easily be given away from 18 pencils.

Main Developmental Activity (30 minutes)

Instead of solving 3-digit subtraction problems directly in the notebooks, we solve the sums through an activity with stars cards. Group the students in pairs. Considering that they have already done the addition of 2-digit numbers with/without borrowing, ask each pair to draw 6 cards. They will make two 3-digit numbers from the card as shown below.



Students will subtract the number and write their answer below the two lines of cards. Once the students understand the concept thoroughly, let them have enough practice of both concrete objects and numbers. Then they are given number (and word) problems to solve on their own. With time and practice, in an identical manner, students are taught conversion of hundreds to tens as well.

Written Assignment (30 minutes)

Page 49 can be given for practices.

Wrap Up (10 minutes)

Ask the students who got the smallest difference of two 3-digit numbers they calculated in main activity.

Suggested Activities

Main Developmental Activities

Whole Class Activity (10 minutes)

Write a 2-digit vertical sum on the board carrying such numbers that lead to conversion of tens for subtraction e.g. 54 and 28. Ask students, to use mental maths to subtract the numbers in the ones i.e. 8 from 4. Let students realise the fact that they cannot subtract 8 from 4. Ask them to borrow a ten from the tens column. Show them how to carry 1 ten from 5, converting the ones number in to tens i.e. 1 ten and 4 ones. Now ask them to subtract 8 from 14 i.e. 6. Make them realise the fact that 1 ten have been taken from tens column, hence it is 4 tens instead of 5 tens. Let them subtract tens numbers the 2 tens from 4 tens and find the answer i.e. 26. Give a lot of practice to students on the board.

Small Group Activity (10 minutes)

Prepare lots of laminated templates of different types and keep them in the classroom for students to practice different subtraction sums using board markers. Refer to pages 41 to 44 of Countdown Book 2 to make different types of templates. Let students practice these templates in pairs or small groups.

Individual Activity (10 minutes)

Give a lot of individual practice to the students for solving subtraction sums using the laminated templates (same templates which were used in small group activities) of different types, as and when they get the time.

Main Developmental Activities

Whole Class Activity (10 minutes)

Write a 3-digit vertical sum on the board carrying such numbers that lead to conversion of tens for subtraction e.g. 335 and 117. Ask students to use mental maths to subtract the numbers in the ones i.e. 7 from 5. As the students have already done these types of sums with 2 digit numbers, they will immediately realise the fact that they cannot subtract 7 from 5. Ask them to borrow a ten from the tens column. Show them how to

carry 1 ten from 3 tens, converting the ones number into tens i.e. 1 ten and 5 ones. Now ask them to subtract 7 from 15 i.e. 8. Let them subtract tens next i.e. 1 ten from 2 tens and then 1 hundred from 3 hundred to find the answer i.e. 218. Give a lot of practice to students on the board.

Also give them practice of converting hundreds.

Small Group Activity (10 minutes)

Prepare lots of laminated templates of different types and keep them in the classroom for students to practice different subtraction sums using board markers. Refer to pages 41 to 44 of Countdown Book 2 to make different types of templates. Let students practice these templates in pairs or small groups.

Individual Activity (10 minutes)

Give a lot of individual practice to the students for solving subtraction sums using the laminated templates (same templates which were used in small group activities) of different types, as and when they get the time.

4 Multiplication

Suggested Time Frame

8 periods

Learning Curve

The students are familiar with addition and repeated addition. They learnt multiplication of 1-digit numbers. They also learnt that multiplication is a form of repeated addition. They learnt skip counting using the number line. Here, they will learn multiplication of 2-digit and 3-digit numbers with 1-digit numbers.

Real-life Application

The multiplication facts can be easily identified when we create arrays. Arrays can be found everywhere in real life around us. They are a fantastic starting point for noticing and describing multiplication (and therefore division) facts. For example:

- Drawer units
- Egg boxes
- Floor tiles
- Wire fencing
- Pictures displayed on a wall
- Marching soldiers
- Chocolate chunks in a bar
- People sitting in a theatre, stadium

Frequently Made Mistakes

- Multiplication errors due to not remembering the times table.

Summary of Key Facts

- Multiplication is repeated addition.
- Numbers follow the commutative property with respect to multiplication.

Model Lesson Plan

Topic

Verification of commutative property of multiplication

Duration

40 minutes

Specific Learning Objective

By the end of the lesson students will be able to compute and verify the commutative property of addition of numbers.

Key Vocabulary

order, commutative, property, and remain.

Resources

Counters

Strategy

Engagement Activity (5 minutes)

Ask students to write the 2 times table.

Main Developmental Activity (20 minutes)

Take 27 counters and arrange them by placing 9 counters in a line and making 3 such lines. Ask the students how many counters there are. Ask the students to calculate the total number of counters, converting it into multiplication language. It will become 3 multiplied by 9 equals 27.

The above activity shows $9 \times 3 = 3 \times 9 = 27$

This implies that the result of 9×3 and 3×9 are the same, irrespective of the order of the numbers.

Write a few sums on the board, like 2×6, 3×9, 2×5, and 9×8

Ask them to copy down these sums in their notebooks and write each sum interchanging the position of the numbers. Then find the product (it will be same every time). Tell this property of numbers is called the commutative property of numbers.

Written Assignment (10 minutes)

Sums on page 76 can be given as homework and classwork.

Wrap up (5 minutes)

Randomly call out a few multiples of two numbers and ask the students to say it by changing the placement of the numbers.

Suggested Activities

Starter Activities

Whole Class Activity (10 minutes)

Show a bag full of a hundred beads to the students. Ask them how we can count all the beads in the bag accurately and in the least amount of time. They will come up with single counting, some will suggest counting in 2s. Show them how that is done, then count the same bag of beads in 5s. Ask the students 'Does that make counting faster?' The students will realise that it is quicker to use multiplication facts.

Whole Class Activity (5 minutes)

Keep a bag full of a hundred beads in front of the whole class. Write any multiplication equation on the board for example $2 \times 4 =$ ____. Ask for a volunteer to come out and take out the beads according to the numbers given. Keep writing different multiplication sums and calling students to take out the beads.

Whole Class Activity (5 minutes)

Write a vertical multiplication sum on the board with tens and ones e.g. $\begin{array}{r} 23 \\ \times\ 2 \\ \hline \end{array}$

Guide students to multiply with ones first and then tens. Give a lot of practice to the students on the board.

Whole Class Activity (5 minutes)

Write a vertical multiplication sum on the board with such numbers in which ones will change after multiplication for example $26 \times 2 =$ ____ . Ask the students to multiply the ones first and tell you the answer i.e. 12. Guide them to carry 1 on top of the tens and write 2 in the ones column. Now ask them to multiply 2 tens with 2 i.e. 4. Add one more ten which has been carried and write the answer in the tens column i.e. 5.

$$\begin{array}{r} 26 \\ \times\ 2 \\ \hline 52 \end{array}$$

Give a lot of practice to the students to solve such sums on the board.

Whole Class Activity (5 minutes)

Write a multiplication sum on the board e.g. $4 \times 2 =$ ______. Let students give you the answer i.e. 8. Now change the order of the numbers and write $2 \times 4 =$ _____ and let them give you the answer i.e. 8. Make the students realise that in multiplication, the answer will remain the same even if the order of the numbers is changed. Let them practice multiple combinations to understand this fact.

Main Developmental Activities

Small Group Activity (10 minutes)

Prepare ten small cards with 2 tiny circles drawn on each card. Provide card sheets to the students and let them count the dots of 1 card and write the equation for $1 \times 2 = 2$, then count the dots of two cards and write $2 \times 2 = 4$ and so on. Let them complete the times table till $10 \times 2 = 20$. Display the chart at a visible place in the classroom.

Prepare and provide similar tiny cards for practicing times tables of 3, 4, 5 etc.

Individual Activity (10 minutes)

Give individual practice to the students for times tables of 2, 3, 4, 5 etc. Let them work with the set/s of tiny cards that have been used in the small group activity, count and write the times tables in their notebooks/ papers.

Small Group Activity (10 minutes)

Prepare lots of small chits with one multiplication sum written on each chit. Also write some sums showing multiplication of numbers with 0. Fold the chits and put them into the basket. Give the basket to a small group of students and let them play the multiplication game. They will pick up chits one by one and say the answer. Other students will tell if the student is right or not.

Individual Activity (10 minutes)

Let students pick up the chits one by one from the basket that has been used in the small group activity. Let them copy the sum on a sheet of paper and write the answer. Ask them to solve 8 to 10 sums at least.

Small Group Activity (10 minutes)

Prepare a lot of laminated sheets containing multiplication sums with tens and ones. Provide board markers to the students with the laminated sheets and let students solve the sums one by one and complete the sheet. Refer to page numbers 70 and 71 of Countdown Book 2 for making the templates.

Individual Activity (10 minutes)

Give laminated templates to the students that were used in the small group activity and let them practice individually. Keep the laminated sheets prepared in the class so the students can practice and strengthen their learning as and when they get the time.

Small Group Activity (10 minutes)

Prepare a lot of laminated sheets containing multiplication sums with tens and ones. Provide board markers to the students with the laminated sheets and let students solve the sums one by one and complete the sheet. Refer to page numbers 72 and 75 of Countdown Book 2 for making the templates.

Individual Activity (10 minutes)

Give laminated templates to the students that were used in the small group activity and let them practice individually. Keep the laminated sheets prepared in the class so the students can practice and strengthen their learning as and when they get the time.

Small Group Activity (5 minutes)

Divide the class into two to three small groups. Ask each group to prepare at least 5 multiplication sums showing the commutative property i.e. the same sum should be written with different order of the numbers, for example $6 \times 2 = 12$ and $2 \times 6 = 12$ etc. The group who will make five sums correctly in the shorter span of time will be the winner.

Individual Activity (10 minutes)

Ask students to make at least two sums with the commutative property independently on paper. Once a student has made the sums, his/ her peer sitting next to him/ her will check his/ her sums and vice versa.

5 Division

Suggested Time Frame

8 periods

Learning Curve

Students are familiar with multiplication. Division can only be understood if there is a sound knowledge of multiplication to build on, and if students have adequate practical experience in this area. Unknowingly, students have plenty of division activity in their everyday lives. Any process that involves sharing equally is, after all, a form of division. They will learn to divide using a number line, times tables, and the long division method.

Real-life Application

Division is frequently used in our daily life. We divide:

- the people in groups.
- money among people.
- a piece of ribbon, cloths, and rope etc into equal parts.
- money when budgeting.
- equal number of toys among siblings.

Frequently Made Mistakes

- Students make errors due to not remembering tables.
- Instead of subtraction, they add the divisors.
- They get confused between dividend and divisor.

Summary of Key Facts

- Division can be described as repeated subtract.
- Division means the grouping, sharing, and dividing of a set of objects equally.

- Dividend, divisor, quotient, and remainder are special terms associated with division.
- Division does not follow the commutative property of numbers.

Model Lesson Plan

Topic
Division using times table.

Duration
80 minutes

Specific Learning Objectives
By the end of the lesson students will be able to divide a number using times tables.

Key Vocabulary
divide, share, group, equally, dividend, divisor, quotient, and remainder

Resource
Times table chart

Strategy
Engagement Activity (10 minutes)

Ask the students to develop a times table of a number of their own choice. Now tell them that division can be performed using the times table. They should be encouraged to learn their times table by heart, so that division of numbers would become an easy task for them.

Main Developmental Activity (40 minutes)
Recall some multiplication facts, for example 3 × 5 = 15 and 5 × 3 = 15

15 ÷ 3 = 5 and 15 ÷ 5= 3

With the help of the times table explain the method to find the quotient.

1	2	3	4	5
2	4	6	8	10
3	6	9	12	15
4	8	12	16	20
1	2	3	4	5
6	12	18	24	30
7	14	21	28	35
8	16	24	32	40
9	18	27	36	45
10	20	30	40	50

36 ÷ 4 = 9　　36 ÷ 9 = 4　　20 ÷ 4 = 5　　20 ÷ 5 = 4

Explain to the students that to find 36 ÷ 4 and 36 ÷ 9, they first find the number 36 in the grid, then they will go vertically upward and horizontally to left of this number. They will find 9 and 4. It means 36 ÷ 4 = 9 and 36 ÷ 9 = 4.

Similarly they can proceed for 20 ÷ 4 = 5 and 20 ÷ 5 = 4.

Written Assignment (20 minutes)

Page number 83, Q1 and 2

Wrap up (10 minutes)

Ask a few random sums from the whole class.

Suggested Activities

Starter Activity

Whole Class Activity (10 minutes)

Prepare a number line on the floor from 1 to 20. Take a few ice cream sticks and write division sums on each ice cream stick (without answer) with the help of a permanent marker, for example 8 ÷ 2 = _____ , 12 ÷ 3 = _____ , and 14 ÷ 7 = _____ etc. Use a number line to solve the sums. For example, 8 ÷ 2 =, ask students to see the first number i.e. 8 and make jumps of 2 till they reach 0. Let them begin with the number 8 and then jump on 6, 4, 2 and 0. Ask them to count the number of jumps i.e. 4. The answer is 4. Let them practice several sums of division with this method. Extend the number line for further practice. Show the students what the quotient, divisor and dividend are.

Main Developmental Activities

Small Group Activity (10 minutes)

Prepare several laminated number lines and provide them to the students with division sums either written on ice cream sticks or on small cards. Divide the class into 4 to 5 groups. Give each group a laminated number line, let them copy the division sums on paper and solve them using the number line.

Individual Activity (10 minutes)

Give individual practice to the students to solve division sums using the number line. Use the same ice cream sticks/ small cards and laminated number lines that were used in the small group activity.

Whole Class Activity (8 minutes)

Write a division and multiplication sentence on the board like 4 x 2 =, 8 ÷ 2 =. Guide students how they can check their division sentence using multiplication. Ask students to observe the relationship between multiplication and division and link division with multiplication. Write more division statements e.g. 36 ÷ 6 =, 28 ÷ 4 =, 16 ÷ 4 = etc. Let students solve these as a whole class. Motivate them to multiply the quotient with the divisor to check their answer.

Small Group Activity (10 minutes)

Divide the class into small groups. Write 6 to 8 division statements on the board. Ask the groups to copy and solve those division statements on paper. Ask students to write multiplication statements as well (multiplying quotient and divisor) beside each division statement to check if their answers are correct.

Individual Activity (8 minutes)

Write division statements on the board and ask students to copy the statements in their notebooks. Ask students to solve the statement independently. Once they solve it, ask them to write the relevant multiplication statement. After writing both the statements, ask them to exchange their notebooks/ papers with their peers (sitting next to them). The teacher will then write the answer on the board and the peers will check each other's work. Solve as many sums as the time allows.

6 Fractions

Suggested Time Frame

8 periods

Learning Curve

Students have a fair idea about fractions much before they come to school. They are asked time and again to share a chocolate bar equally with their siblings—if there is just one other child then each gets half. If there are 3 other students, each gets half of a half, i.e. a quarter.

Activities involving fractions ($\frac{1}{2}$ and $\frac{1}{4}$) increase both their visual and analytical skills. Students work with a variety of shapes and quantities, such as a net bag full of 10 marbles or 20 mints, etc.

Real-life Application

We can find fractions everywhere around us. Slices of a bread, cake, and pizza are very common examples. Fractions are used such as $\frac{1}{2}$ glass water, quarter spoon spices, $2\frac{1}{2}$ glasses of milk, and $\frac{1}{3}$ cup of flour etc. In time we say half hour and quarter hour.

Frequently Made Mistakes

- Confusion in writing numerator and denominator in the proper place.
- Matching fractions with shapes.

Summary of Key Facts

- There are proper, improper, and mixed fractions.
- Unit fraction has 1 in the numerator.
- Equivalent fractions are obtained by multiplying or dividing the numerators and denominators with the same number.

Model Lesson Plan

Topic

Learning one-third and more fractions.

Duration

80 minutes

Specific Learning Objective

By the end of the lesson students should be able to Recognise and write the unit fractions and other fractions which are not unit fractions.

Key Vocabulary

fraction, equal parts, divide, shape, one-third, and unit fraction.

Resources

Two big circular cutouts, A pair of scissors, Small circular cutouts counted as per the number of students in the class.

Strategy

Engagement Activity (10 minutes)

Distribute small circular cutout to each child. Ask half of the rows to divide it into halves and half of the rows in quarters using scissors. Ask them to show their half and quarter pieces, then reinforce halves and quarters by comparing the shapes.

Main Developmental Activity (30 minutes)

Now hold the big circular cutout and show it to class. Fix it on the board and asking for their attention divide the circle in three equal parts with a pencil and a ruler. Shade one part of the circle. Ask the students that from three equal parts what will be the fraction of shaded part. Recall that $\frac{1}{2}$ and $\frac{1}{4}$ are the fractions obtained from two and four equal parts of the shapes. So when we have thee equal parts the required fraction will be $\frac{1}{3}$. Tell them when we take one part out of more than one equal parts, these fractions are known as unit fraction. This concept can be extended to any number of shaded parts from equal parts of a shape. Divide the other big circle into eight equal parts as done previously. Shade three parts of them. Ask the students what the fraction will be. It will be $\frac{3}{8}$. Reinforce the learning by shading different number of parts.

Written Assignment (20 minutes)

Practice sums on page 100

Wrap up (10 minutes)

Draw different shapes on the board and divide in different numbers of equal parts. Colour some of the parts in each shape. Ask the students what fraction each shape is showing.

Suggested Activities

Starter Activity

Whole Class Activity (5 minutes)

Take a square or a circle cut-out of paper and show how to fold a shape in to halves, making sure that each half is of the same size. Explain that they need to fold it, draw a line down the fold and stick it in their notebooks or on papers.

Show how to fold a shape into quarters, making sure that each quarter is the same size. Explain them how they fold two of each shape; one for halves and one for quarters and stick them in their notebooks or on papers.

Main Developmental Activities

Whole Class Activity (10 minutes)

Provide cut-outs of squares and ask students to fold them in halves and then quarters. Cut some of the shapes along the folded lines and place the four parts on top of each other to show that they are equal.

Now, support the understanding of the relationship between fractions of shapes and fractions of numbers by asking students to divide a quantity of objects between four. They can place an equal number of objects on the quarters of different shapes divided equally into four.

Show students how fractions can be written in words (half, quarter or one third) and in numbers ($\frac{1}{2}$, $\frac{1}{4}$ or $\frac{1}{3}$).

Whole Class Activity (10 minutes)

Show different fractions in shapes and in numbers. Explain how the bottom number in a fraction tells you how many equal-sized pieces the shape has been split into and the top number shows how many parts. Emphasise how each portion of the shape needs to be the same size. Do a couple of examples of making shapes on the board and sometimes make deliberate mistakes (students should react and say 'No! That's wrong'). Ask them to explain why it is wrong. Explain the concept of $\frac{2}{5}$, $\frac{4}{6}$, $\frac{3}{7}$ etc.

Small Group Activity (10 minutes)

Divide the class in small groups and provide 2 to 3 cut-outs of any shape (circle/ square etc.) to each group. Provide 2 to 3 chits as well with different fractions (e.g. $\frac{1}{2}$, $\frac{2}{4}$, $\frac{4}{8}$ etc.) written on them. Ask the students to see the chits and draw the parts using pencil and ruler. Also ask them to colour the fractions.

7 Money

Suggested Time Frame

6 periods

Learning Curve

Students get their first idea of money from their shopping expedition with their parents or elder brother or sisters. They realise that in exchange of notes and coins they are able to buy a whole lot of things. Later, they understand the meaning of getting 'change' back from a shopkeeper if they do not tender the exact amount.

Real-life Application

Application of money is involved in:

- purchasing goods
- savings
- pocket money
- selling goods
- paying bills
- banks

Frequently Made Mistakes

- They make mistakes in differentiating the value of money.
- Difficulty in comparing different denomination of currency.

Summary of Key Facts

- Money is found in coins and paper notes.
- No purchasing and selling can be done without money.

Model Lesson Plan

Topic

Addition and subtraction of money of same denomination

Duration

80 minutes

Specific Leaning Objective

By the end of lesson students will be able to add different prices of the items and sort out whether they can buy those items from the money they have. Moreover if they tender a bigger note for their purchasing, they can calculate how much money they are going to receive back.

Key Vocabulary

buy, purchase, shopping, payment, total money, and receiving back.

Resources

Many different objects with price tags, fake notes of different values (many in quantity).

Strategy

Engagement Activity (10 minutes)

Show them 5 one rupee notes and a 5-rupee note and ask them which one is greater?

Get the answers from the students and reinforce that the denomination of the two amounts are different but the value is the same.

Main Developmental Activity (30 minutes)

Divide the class into groups of four. Hand over two objects with price tags to each group. Make sure that the sum of the prices does not exceed Rs 50. Hand over the money to each group in such a way that each group receives a combination of fifty rupees.

Now instruct them to check the price of each object, add them, then subtract the total from the money they already have with them. In this way they will perform addition and subtraction at the same time. Ask them whether they have enough money to pay for the objects the have.

Teacher should display the steps, doing it herself for the first time.

Guide each group, asking them to divide the task among themselves.

Different play shops or markets could be set up by the students themselves with the help and guidance of the teacher.

- Card shop
- Grocery store
- Flower shop
- Stationery shop

Written Assignments (20 minutes)

Practice sums on page 106

Wrap up (10 minutes)

Distribute two toffees to each of them as the appreciation of their efforts. Ask if each toffee cost Rs 4,how much 4 toffees will cost?

Suggested Activities

Starter Activities

Whole Class Activity (8 minutes)

Introduce Pakistani currency to the students: Rs.10, Rs.20, Rs.50, Rs.100, Rs.500, Rs.1000 and Rs.5000. Also show them the coins of Rs.1, Rs.2 and Rs.5.

Tell them the price of different things and ask them to tell you the amount, which is needed to buy those things. For example, show them a book of Rs.40 and ask them which note will they pick up if they want to buy this book. Let them practice several such examples.

Whole Class Activity (8 minutes)

Give a lot of opportunities to the students to practice addition and subtraction of money. For example ask them: If you have to buy a game of Rs.230, which notes will you add to buy it? or If you have Rs.650, you bought a game of Rs.230, how much money are you left with?

Whole Class Activity (8 minutes)

Give a lot of opportunities to the students to practice multiplication and division of money. Ask them: If you have to buy 2 pencils of Rs.50 how much money would you pay? Encourage them to multiply rather adding. If you have Rs.100, how many pens of Rs.50 can you buy? Give a lot of practice to the students to enhance the learning.

Main Developmental Activities

Small Group Activity (10 minutes)

Set up a 'Supermarket' in the classroom and provide fake or photocopied money to the students.

Ask the students to go to that 'Super Market' in small groups, find the total cost of the goods they want to buy and use the currency wisely. Guide them to pay using exact amounts of money. They will see tagged prices on items and buy. Give them a sheet of paper and ask to record the findings.

Individual Activity (10 minutes)

Give laminated templates to the students and let them practise individually. Refer to page 105 of New Countdown Book 2 to make templates. Keep the laminated sheets prepared in the class so the students can practise and strengthen their concepts as and when they get the time.

Small Group Activity (10 minutes)

Divide the class into small groups. Create some purses or envelopes with notes of different denomination in them. Ask the students to work out the total amount in the purse.

Individual Activity (10 minutes)

Write the price of 4 to 5 different objects on the board, for example, Book – Rs.25, Pencil – Rs.13, Ruler – Rs.26 etc. Let students write the combination of money required to buy each object i.e. to buy a book Rs.20 and Rs.5, for pencil Rs.10, Rs.2 and Rs.1 etc.

Small Group Activity (10 minutes)

Divide the class into small groups and ask them to design/ make any one word problem related to the multiplication of money. Once they are done with making the word problem of multiplication, they can be motivated to make a word problem of division related to money.

Individual Activity (10 minutes)

Make a price list on one corner of the board e.g. Book – Rs.150, Bottle – Rs.250, Sharpener – Rs.50, Eraser – Rs.15 etc. On the other side write the quantity of things that you need to buy i.e. 2 books, 3 bottles, 4 sharpeners, 5 erasers etc. Ask the students to multiply and then add the numbers to give you the total money that you need for shopping.

8 Measurement: Length, Weight, and Capacity

Length

Suggested Time Frame

6 periods

Learning Curve

Students have worked with long, longer and longest; short, shorter and shortest in Class 1. Also, they are familiar with many words which mean the measurement of length, such as metres of cloth, height of a child, length of the road to school and the tallest building in the world.

Real-life Application

- Length is an important and basic unit of measurement used in our daily life found all around us.
- Length is used in measuring distance.
- The distance from your house to the grocery store, your uncle's house, or the nearest park are measured in units of length i.e. kilometres or metres.
- The height of a tree, a building, wall, peoples, mountains, and hills etc are measured in metres.
- Games like cricket, hockey, badminton, tennis, and football are very popular among the people. The length of the cricket pitch, length and breadth of the tennis and badminton courts, and football grounds are measured in metres.

Frequently Made Mistakes

- They make mistakes in reading length while using the metre rule.
- Usage of incorrect units.
- Inappropriate usage of units with the objects.

Summary of Key Facts

- The length of something is the distance between the two ends.
- The length of something can be measured in metres, centimetres, and millimetres.
- Short means of small length.
- Long means having big length.
- Short and long are opposites.
- Length is also a property of time. An amount of time has a length.

Model Lesson Plan

Topic

Addition of units of length (m, cm)

Duration

80 minutes

Specific Learning Objective

By the end of the lesson, students will be able to add the length of objects measured in metres and centimetres both.

Resources

A metre rule, glue or jam clips, and two pieces of ribbons of different lengths and colours.

Key Vocabulary

length, distance, ruler, centimetre, metre, units, and measure

Strategy

Engagement Activity (10 minutes)

Ask the students to measure the length of their lunch boxes in cm. Now ask every two students sitting on the same desk to add the lengths of their lunch boxes on a piece of paper. Take the feedback by asking the sum from each desk.

Main Developmental Activity (25 minutes)

Show them two different colour ribbons and tell them that you are going to measure them separately. Take the metre rule and measure it in front of the students. Say the length is 1 m and 30 cm. Write this measurement on the board. Now take the other piece, repeat the same procedure, say the length is 1m 50 cm, write the measurement on the board. Now tell them that it is easy to find the addition of lengths which have both the units m and cm. Write the two quantities on the board vertically. Tell them, first we add cm and write the total under cm. Then add the metres and write the total

under m. The result will be the total length of two ribbons. At this level total number of centimetres should not exceed or be equal to 100.

Now join the two pieces with some glue or jam clips. Measure the length of the joined ribbon. The length will be equal to the length calculated on the board. A little difference in the length may be due to the overlapping of the ribbons to join them.

Written Assignment (35 minutes)

Practice sums on page 112

Wrap up (10 minutes)

Write two addition sums on the board and ask them to solve in their notebooks. Take continuous rounds checking them on the spot.

Suggested Activities

Length

Starter Activities

Individual Activity (10 minutes)

Ask all students to take out their rulers and pencils. Motivate them to measure the length of their pencils and record their answers in their notebooks along with the unit of length i.e. cm.

Small Group Activity (10 minutes)

Choose an object 20 or 30 cm tall and let the group measure its height using a ruler. Remind them how to line up the object with 0, so that the height is measured accurately and how to read the scale where it ends. Let them record the height of the object.

Small Group Activity (10 minutes)

Divide the class into small groups and give each group a string of 1 m/ 2 m/ 3 m etc. Let them measure the string using a metre rule and convert metres into centimetres. Also, provide lengths of string which can be measured in both metres and centimetres e.g. 2 m and 10 cm, 1 m 5 cm etc.

Small Group Activity (10 minutes)

Provide eight to ten different figures to the students e.g. 1100 m, 1300 m, 1260 m, etc. Ask them to convert these metres into kilometres i.e. 1 km and 100 m, 1 km and 300 m, 1 km and 260 m etc. Also provide them numbers to convert into kilometres such as 1000 m and 400 m, 1000 m and 29 m etc.

Whole Class Activity (8 minutes)

Discuss about hand span, feet etc. to measure height and length. Keep questioning and let them come up with the idea of using a ruler. Let students observe their rulers and see the centimetres written on them. Show students a metre rule. Say this is one metre

long. Show them the use of a ruler with centimetres and then compare with a metre rule. Compare the heights of two students. Show the students the short forms of writing metres and centimetres i.e. m and cm.

Main Developmental Activities

Whole Class Activity (10 minutes)

Guide students to change lengths in cm and m, using the fact that 100 cm = 1 m. Make sure students have access to a metre rule and a centimetre ruler for support. Demonstrate measuring the heights/ lengths of students in front of the whole class, writing the figures on the board and then converting the numbers into metres or centimetres.

Individual Activity (10 minutes)

Give laminated templates to the students and let them practice the conversion independently. Refer to page number 111 of Countdown Book 2 to make the templates. Keep the laminated sheets prepared in the class so the students can practice and strengthen their learning as and when they get the time.

Whole Class Activity (10 minutes)

Involve the students in measuring the length of one string in front of the whole class e.g. 1 m and 3 cm. Ask them to measure the length of another string e.g. 3 m and 5 cm. Write both lengths on the board. Guide students to add the length of two strings, adding centimetres first and then metres, i.e. 4 m and 8 cm.

Provide similar examples for subtraction as well.

Whole Class Activity (10 minutes)

Let students estimate the distance of their homes from the school in metres. They will come up with different answers. Wait for the answer with the figure of one thousand metres and if they don't come up with it, you tell the students that your house is 1000 m away from the school. Guide them with the fact that 1000 m is equal to 1 km, therefore my house is 1 km away from the school. Discuss the distance of different places and let them estimate the distances.

Individual Activity (10 minutes)

Tell students that they will be assessed today. Write different figures on the board for converting metres into kilometres and kilometres into metres, one by one. Write one figure, let the students write their answer and then write another figure. Ask the students to write the correct answer in their notebooks without showing it to their peers. Mark students on their work.

Weight

Suggested Time Frame

6 periods

Learning Curve

Students are familiar with many words which indicate weight. They have heard in their daily-life experiences people talking about kilos of fruits and grams of chocolates, butter, etc. They are even familiar with words, such as heavy and light in Class 1. Slowly, students discover that the lighter object is not necessarily the smaller one.

Real-life Application

In the old days, people compared the weights of objects by lifting them in their hands. Students try this with daily life objects and make a note of their findings—a lunch box is lighter than a bag of books. Charts and a story about astronauts going to the Moon make information interesting. On the surface of the Moon everything weighs less than it does on our planet Earth. The knowledge of weight is used in many ways in our daily life.

- We buy vegetables, fruit, lentils etc in kilograms and grams.
- In cooking, ingredients are used with specific weights.
- Students have less weight than adults.

Frequently Made Mistakes

- Using inappropriate units for the objects of different weight.
- Making mistakes in deciding the same units for addition or subtraction.
- Not taking care of the same units while adding and subtracting.

Summary of Key Facts

- Kilogram and gram are the fundamental units of weight.
- Every object has some weight.
- The weight of objects can be converted from bigger units to smaller units and vice versa.

Model Lesson Plan

Topic

Using weights (grams)

Duration

80 minutes

Specific Learning Objective

By the end of the lesson, students will be able to use gram weights.

Key Vocabulary

weight, weigh, kilo, kilogram, and gram

Resources

Weights of 500 g, 200 g, 100 g, 50 g, and 10 g. A chart paper with pictures of a tiger, an insect, a book, and a box of milk packs.

Strategy

Engagement Activity (10 minutes)

Paste the chart on the board, write the approximated weight of a tiger (400 kg), a book (500 g), an insect (1 kg), and a box of milk packs (3 kg). Ask the students to identify which of the weights is not reasonable. Discuss their answer for a few minutes, coming to the final answer, that an insect cannot be as heavy as 1 kg.

Main Developmental Activity (30 minutes)

Now show them 500, 200, 100, 50, and 10 gram weights. Distribute the weights in the class to feel the heaviness. They will keep on exchanging the weights until the whole class will get the opportunity to experience all of the weights. Write the names of a few objects on the board and ask them to tell the approximated weights of the objects.

At this stage they can be taught that using these weights they can make 1000 g by grouping them differently. Referring to page 122 show and explain to them the different combinations of the weights.

Written Assignment (30 minutes)

Page 122 Q 6 and a practice worksheet prepared by the teacher.

Wrap up

Ask randomly how many 200, 500, 50, 10 weights make 1000.

Suggested Activities

Main Developmental Activities

Whole Class Activity (10 minutes)

Bring a weighing balance to the classroom and let students measure the weights of different classroom objects using weights of grams and kilograms. For e.g. keep five notebooks on one side of the balance and ask students to start putting the weights on the other side until the weight of both the sides is balanced. Ask them to check the weight of the notebooks by checking the weights kept on the other side e.g. 1 kg and 5 g. Give at least 4 to 5 similar experiences of weighing.

Small Group Activity (10 minutes)

Provide a weighing balance, weights and a list of classroom objects that have to be weighed e.g. five notebooks, a bag, two water bottles, three lunch boxes etc. Let students collect the objects and weigh them. Also ask them to record their findings, show their findings to their teacher and save it for later use.

Individual Activity (10 minutes)

Write different figures on the board for converting grams into kilograms and kilograms into grams, one by one. Write one figure, let the students write their answer and then write another figure. Ask the students to write the correct answer in their notebooks without showing it to their peers. Mark students on their work.

Whole Class Activity (10 minutes)

Weigh two different objects separately in front of the class. Write the weight of each object on the board. Let students add the weight of both objects while guiding them to add grams first and then the kilograms. Once they find the answer, tell them that this is the weight of both the objects. Just for better understanding, weigh both the objects together on the weighing balance to check if their answer was right or not.

Similarly guide them to subtract the weight of one object from the other object to find the difference in weight.

Small Group Activity (8 minutes)

Divide the class into three to four groups. Provide a list of figures in kilograms and grams to each group (at least 8 to 10 sets) for addition and subtraction. Let each group add and subtract grams and kilograms. The group who will solve all sums correctly in the shortest span of time will be the winner.

Individual Activity (10 minutes)

Let students practice conversion of grams and kilograms, addition of grams and kilograms and subtraction of grams and kilograms independently. Provide them any medium which is convenient for you e.g. laminated templates, worksheets, notebooks etc.

Capacity

Suggested Time Frame

4 periods

Learning Curve

Students get a fair idea about capacity by playing with different containers, filling them with sand, clay or water. Vocabulary such as full, empty and half-full are applied to various containers.

A bucketful of water, a spoonful of medicine, a cupful of hot chocolate, etc.; students are familiar with these phrases in their daily life. Situations, such as the petrol tank of a car gets 20 litres of petrol in it at the petrol pump, the bathtub is filled with 50 buckets of water when there is a water shortage and a bottle has 1 litre of soda, etc. are discussed. Also, comparative capacities like, will a narrow, tall glass hold more water than a flat, wide plate?

With practical work students understand that the word 'capacity' refers to the amount of liquid a container can hold.

Real-life Application

- Doctors recommend 8 glasses of a water a day which is about 2 litres.
- If a car's fuel tank holds 25 litres of petrol, it means its capacity is 25 litres.
- We also find measuring cups and spoons with different capacities in the kitchen.

Frequently Made Mistakes

- Difficulty in estimating the capacity of different sized containers.
- Sometimes the students cannot recall that 1000 ml makes 1 litre.

Summary of Key Facts

- 1000 ml = 1 litre.
- big quantities of liquid are measured in litres.
- small quantities of liquid are measured in millilitres.

Model Lesson Plan

Topic

Converting millilitres into 1 litres

Duration

80 minutes

Specific Learning Objectives

By the end of the lesson, students will be able to measure liquids in 500, 250, 100, and 50 ml containers and converting them into litre measures.

Key Vocabulary

capacity, containers, and millilitres.

Resources

Beakers and flasks of different capacity used in the science laboratory, 10 ml and 30 ml empty washed medicine bottles, an empty litre bottle, a jug of water.

Strategy

Engagement Activity (10 minutes)

Show them two medicine bottles one 10 ml and the other 30 ml in capacity. Ask how many 10 ml bottles will fill the 30 ml bottle. Take the feedback and explain if there is any ambiguity.

Main Developmental Activity (30 minutes)

Arrange a table with containers of different sizes and put estimation cards in front of different containers. Ask the students to guess the capacity of the container and write it down on the cards. Later, ask them to fill the containers and write down the actual capacity of the containers.

Written Assignment (30 minutes)

Page 129 Q 2, 3 practice sums can be done in the class.

Wrap up (10 minutes)

Ask them to solve division facts on page 129.

Suggested Activities

Starter Activity

Whole Class Activity (5 minutes)

Measure the capacity of two different containers separately in front of the class. Write the capacity of each container on the board. Let students add the capacity of both

containers while guiding them to add millilitres first and then the litres. Once they find the answer, tell them that this is the total capacity of both the containers.

Similarly guide them to subtract the capacity of one container from the capacity of another container to see the difference in capacity.

Main Developmental Activities

Individual Activity (10 minutes)

Let each student measure the amount of water present in their water bottles, using the measuring beaker/ cup. Let them record their findings in their notebooks. Break time and Math periods can be used for performing this activity.

Whole Class Activity (8 minutes)

Provide a range of measuring beakers, jugs and other containers, and give students plenty of time to explore. Let them spend some time exploring how to read scales on a measuring beaker and challenge students to measure 50 ml of water or 200 ml of water and so on. Tell them about litres and the difference between litres and millilitres, connecting it with the concept of grams and kilograms and also metres and centimetres.

Small Group Activity (10 Minutes)

Divide the class into 3 to 4 groups. Provide them with cold, clean drinking water, a packet of Orange Squash, a jug, a spoon and a measuring beaker. Challenge students to make 1 litre of orange drink for the whole group.

Small Group Activity (8 minutes)

Divide the class into three to four groups. Provide a list of figures in litres and millilitres to each group (at least 8 to 10 sets) for addition and subtraction. Let the group add and subtract litres and millilitres. The group who will solve all sums in a shorter span of time will be the winner.

Individual Activity (10 minutes)

Let students practice conversion of litres and millilitres, addition of litres and millilitres and subtraction of litres and millilitres independently. Provide them any medium which is convenient for you e.g. laminated templates, worksheets, notebooks etc.

9 Time

Suggested Time Frame

6 periods

Learning Curve

They have a fair idea about time, long before they come to school—wake-up time, school time, lunch break and meal time, etc. They have heard their parents or teachers speak about summer vacations, monsoon floods and winter clothes.

Students best understand time if it is taught to them in relation with their own experience. They know that there are seven days in a week and are familiar with the names of the days in a week. They also know that there are an average 30 days in a month and 12 months in a year. With the passage of time, they get familiar with dates of the month in association with the days of the week and the names of the months.

With greater exposure and practice, they are able to read the clock face and are able to tell the time accurately.

Real-life Application

- Students can make a timetable for their daily activities. For example, breakfast time, school time, break time, lunch time, play time, reading time, and sleep time.
- We find time on invitation cards, doctor's appointments, and meeting slips etc.
- A program list of a conference or any event.
- Important national and universal days and dates.

Frequently Made Mistakes

- Making mistakes in differentiating big and small hands of a clock.
- Making mistakes in converting 5-minute intervals of time.

Summary of Key Facts

- There are 24 hours in a day, 60 minutes in an hour, and 60 seconds in a minute.
- There are 12 months in a year, 4 weeks in a month, and 7 days in a week.
- There are 365 days in a week.
- From midnight till noon, "a.m." is written with the time and from noon till midnight, "p.m." is written with the time.

Model Lesson Plan

Topic

To tell time in 5-minute intervals

Duration

80 minutes

Specific Learning Objective

By the end of the lesson, students will be able to tell the time in hour and minutes.

Key Vocabulary

hour, minute, interval, and clock.

Resources

A big clock drawn on a coloured chart paper, showing big and small hands cut in strips of chart paper attached in the centre of the clock with a common pin to move freely.

Strategy

Engagement Activity (10 minutes)

Write the topic Time on the board and ask students to discuss about time with their partners. Guide them to talk about their daily routine. They can share their play time, bed time, and story time, etc. After 5 minutes ask a few students to share their ideas with other students.

Main Developmental Activity (30 minutes)

Explain to students that they will be learning about 5 minutes interval time. Reinforce the learning of exact time and half past time. Display the big clock on the board. Move the hands of the clock, telling the time with hours and minutes. Tell them that there are 5 minutes from one digit to the next digit and we start counting from 12. So from 12 to 1 it is 5 minutes and from 1 to 2 it is again 5 minutes. Therefore from 12 to 2 will make 10 minutes. In the same way we keep on adding 5 minutes every time. As repeated addition is a form of multiplication, so minutes can be found by checking the placement of the big hand and multiplying the number with 5.

Move the hands of the clock onto different numbers and ask the time.

Written Assignment (25 minutes)

Practice the sums on page 142

Wrap up (15 minutes)

Write two different times with hours and minutes and ask the students to draw the clocks showing the time in their notebooks. Take rounds looking into each student's working.

Suggested Activities

Starter Activity

Whole Class Activity (8 minutes)

Use a globe and a torch to demonstrate how the Earth rotates and the Sun shines on the Earth. Students are not yet expected to understand how the Earth's rotation explains night and day, but the visual image of the rotation of the Earth taking 24 hours from midnight to midnight helps students to understand the concept.

Main Developmental Activities

Whole class activity (10 minutes)

Talk about 24 hours in a day. Show a real analogue clock to the students to demonstrate time. Spend time talking with students about the clock's face, the movement of the hands, the hours scale that they can see on the clock, and minute scale that is not seen, but can be worked out using the hour scale. The hour time is when the hour hand is on the number or any point before the next number on the clock face. Give them the idea of morning and afternoon, evening and night time.

Small Group Activity (10 minutes)

Create a large version of the 24-hour timeline on the floor, outside the classroom. Let students take turns to walk along the hours. Ask the students to say what they think they do each hour.

Individual Activity (10 minutes)

Encourage students to make a booklet of their timetable and activities as a diary account, identifying how much time is planned for activities. For example "I go to swimming class at 3 o' clock; I do my homework at 5 o' clock; I watch television at 6 o'clock etc. Let them depict their timetable through writing and drawing.

Whole Class Activity (10 minutes)

Show students an analogue clock and talk about what each hand does. Starting with both hands pointing to 12 o' clock, show how to move the minute hand all the way round the clock, so one hour has passed; the hour hand must now move on to the 1 to show 1 o' clock, an hour later. Explain that you are just showing how the clock hands work and that over an hour, the hands move so slowly that we don't notice them moving.

Once students are familiar with setting the clock to a particular hour, give them the concept of half past. Stop the minute hand at six, saying that the hand got stuck halfway around the clock. Ask what 'o'clock' they have just seen, e.g. nine o'clock. Explain that the time shown is not o'clock; it is halfway between nine o'clock and ten o'clock and we call this 'half past nine'.

Talk through where the minute hand on a clock needs to be to read half past, demonstrate the half turn on the clock. Remind students that the hour hand will also move from one number to halfway towards the next number. Ask students to display some half past times on their clock/ wrist watch, checking the position of both hands.

Students are already familiar with the time sentences as, '1 hour has 60 minutes, so, 60 minutes makes one hour. Explain that they will use their multiplication table facts for five and counting in fives to help them tell the time. Set the clock to any o' clock time and motivate students to count in fives until they reach 12 i.e. 60 minutes. Explain that the minute hand takes five minutes to move from one digit to another.

Small Group Activity (10 minutes)

Divide the class into three to four groups and give an analogue clock to each group. Call out any time e.g. 6 o'clock, half past 3, 10 past five, 5 minutes to 8 etc. and ask the group to show you the time on the clock.

Give the groups a piece of paper each. Make a time on the analogue clock e.g. 6 o'clock, half past 3, 10 past five, 5 minutes to 8 etc., one by one. Ask students to write the time on the paper. Check their paper to see if they have correctly written the time or not.

Individual Activity (10 minutes)

Provide cut-out copies of blank clock faces to all students. Also provide a list of times to them and ask students to draw the hands on the cut-out copies of a clock according to the given list. You can also prepare a stamp of a clock without hands and stamp it on papers instead of providing copies to the students.

Whole Class Activity (10 minutes)

As the concept of 24 hours is already given to the students, introduce the term a.m. for the time between midnight and noon and p.m. for the time between noon and midnight. Write a couple of examples on the board e.g. 8 o' clock in the morning, 7 o' clock in the evening, the time you come to school, the time you go to bed etc. Let students tell you as a group if they will use a.m. or p.m. for the given time.

Small Group Activity (10 minutes)

Prepare a list of times e.g. 6 o' clock in the morning, 8 o' clock at night, 2 o'clock in the afternoon. Refer to page number 145 of Countdown Book 2 to prepare the list. Divide the class into groups and provide the same list to each group. Let them use a.m. or p.m. for each given time. The group who will write all the correct answers will be the winner.

Individual Activity (10 minutes)

Prepare a story of 8 to 10 sentences with blanks given for a.m. and p.m. and let students insert a.m. or p.m. in the blanks. For example, Ali wakes up at 6 _____. He takes his breakfast at 7 ____. His school starts at 8 _____ and comes back home at 2 _____. He takes a nap from 3 _____ to 5 _____ and so on.

Whole Class Activity (8 minutes)

Discuss about days of the week, months of the year, solar and lunar calendar with the students.

Talk about the events/ festivals related to different months of the lunar calendar e.g. special things about Muharram, Rabi-ul-Awwal, fasting in the month of Ramzan, Eid-ul-Fitr in the month of Shawwal, Hajj and Eid-ul Adha in the month of Zil Hajj etc.

Small Group Activity (10 minutes)

Prepare many small chits with a question/ statement/ statement with a blank in between written on each chit. Refer to page number 148, 150 and 151 of Countdown Book 2 for making the chits. Fold the chits and put them in a basket. Let students sit in a circle and sing a song and as you sing the students can pass the basket around the circle as they sing along with you. When you stop, the student holding the basket will pick out a chit, open it and let others know what is written on the chit. He/ she will then tell the answer and all other students will tell if he/ she has given the correct answer or not.

Individual Activity (10 minutes)

Provide students with slips of paper and let them write the days of the week on each slip. Once they are done with the writing part provide them a strip of paper. Let them order the days of the week on that strip with the help of glue then joining the ends to make a ring to demonstrate the cyclic nature of each week.

The same activity can be repeated for months of the year, both solar and lunar.

10 Shapes

Suggested Time Frame

6 to 8 periods

Learning Curve

Students are familiar with 3D and 2D shapes from their daily life. They have seen and held objects, such as a ball (a sphere), a dice (a cube), a toothpaste box or a lunch box (a cuboid), an ice cream cone (a cone), etc.

They have also felt the flatness of shapes, such as a floor tile (a square) or a windowpane (a rectangular), a round plate (a circle), a kite (a quadrilateral) and the 4 parts of a kite (triangles). They have a visual idea of what each looks like, but often get confused with names. At this level their knowledge of shapes takes a slightly more formal shape.

Real-life Application

We have different sized and shaped objects around us. We can see triangles, squares, and circles everywhere. Some of these shapes have length, breadth, and height and are the 3D or the three-dimensional objects. For example houses have length, breadth, and height and are 3 D objects. Others like a sheet of paper can be imagined to have a length and a breadth only. Such objects are two-dimensional objects and are 2D shapes.

Frequently Made Mistakes

- The students make mistakes in identifying and differentiating the faces and vertices of 3D shapes.
- Difficulty in recalling the names of the shapes.

Summary of Key Facts

- The 3 D shapes are composed of three dimensions. They have faces, edges, and vertices.

- A cube, rectangular prism, sphere, cone and cylinder are the basic 3-dimensional shapes we see around us.
- Some 3D shapes have flat faces, some have curved faces, and some have both.
- The 2D shapes are composed of two dimensions i.e. length and breadth.

Model Lesson Plan

Topic
3 D Shapes

Duration
60 minutes

Specific Learning Objective
By the end of the lesson, students will be able to identify the faces, edges, and vertices of a cube.

Key Vocabulary
cube, cuboid, vertex, faces, edges, sphere, cone, and cylinder.

Resources
Wooden geometrical solids

Strategy

Engagement Activity

Small Group Activity (10 minutes)

Divide the class into groups and let each group list the name of the things that they can find in a cube and cuboid shape. Ask them to write as many things as they can.

Main Developmental Activity (25 minutes)
Use Geometrical Solids (easily available in the market) for introducing the shapes. Let students explore different 3D shapes. Ask: What is the same? What is different? The cube looks the same when it is turned because every face is a square. Cuboids can be laid down or stood up on the longer or shorter faces. Let students count the total number of faces, edges and vertices on both the cube and cuboid. Let students feel the face, edges, and corners of the shapes by holding the shapes in their hands. Ask them how many corners and faces there are in a cube.

Written Assignment (15 minutes)
Make a worksheet to match the faces, edges, and vertices of a cube. Moreover, ask on the same worksheet the number of faces, edges, and vertices in a cube.

Wrap up (10 minutes)
Show them some pictures of objects and ask them to identify the cube shaped objects.

Suggested Activities

Starter Activity

Whole Class Activity (8 minutes)

Let students observe different straight and curved lines present around them in the classroom. Ask them to take out their Maths notebooks and ruler. Motivate them to measure the straight lines in the notebooks in centimetres.

Main developmental Activities

Whole Class Activity (8 minutes)

Use Geometrical Solids (easily available in the market) for introducing the shapes. Let students explore different 3D shapes. Ask: What is the same? What is different? Talk about the faces, edges and vertices of all shapes. Give students a sphere and a cylinder. They both have a curved surface. The sphere has only a single curved surface. Establish that the cylinder has two ends that are circles joined by a curved surface. Talk about the cone as well, discuss its faces, edges and vertices

Small Group Activity (10 minutes)

Divide the class into two teams. Put all (or selected) 3D shapes in a feely bag/ brown paper envelope. Give the bag/ envelope to the first team. Let any one student put his/ her hand in the envelope. Now the student will describe the 3D shape that he/ she is holding in his hand, telling about its faces, edges and vertices and the rest of the team members have guessed the shape. After the team members have guessed the shape, he/ she will take out the shape to check if the team members have taken the right name or not. They will score one point if they are correct. Repeat the same procedure with the other team and so on. The team who will score more points will be the winner.

Individual Activity (10 minutes)

Let students list down the names of the 3D shapes that they have learned. Also ask them to write the faces, edges, vertices and the name of any one object that they see in the environment related to that shape.

Small Group (8 minutes)

Challenge students to draw any object of their choice using straight and curved lines. Once they have drawn, ask them to count the number of straight and curved lines that they have drawn.

Individual Activity (10 minutes)

Provide laminated templates with lines of different sizes drawn on it. Let students measure the length of each line with a ruler and write its length. Also provide different lengths to the students and ask them to draw straight lines accordingly.

Answers of Word Problems

Unit 2 Addition

Page 25	2. a. 94 runs	b. 86 beads	c. 15 animals		
Page 31	9. a. 43 trees	b. 41 bananas	c. 42 buckets		
Page 35	2. a. 260 stamps	b. 370 pages e. 190 saplings	c. 174 grapes	d. 877 children	
Page 39	1. a. Aamir	b. Majid	c. Aliya	d. 3	
	e. 70	f. 190			
	2. a. 11 marbles	b. 63 marbles	c. 37	3. 26 fish	

Unit 3 Subtraction

Page 41	2. a. 12 flowers	b. 41 rabbits		
Page 44	5. a. 15 toys	b. 16 can	c.36 people	d. 8 fish

Unit 4 Multiplication

Page 69	2. a. 24 flowers	b. 56 goldfish	c. 42 buttons	d. 32 buns
	e. 28 legs	f. 36		

Unit 5 Division

Page 82	b. 2 and 3	c. 2	d. 5 and 3	
Page 86	1. b. 6 packets	c. 6 teams	d. 9 eggs	e. 4 samosas

Unit 7 Money

Page 103	1. b. 2 rupees	c. 6 rupees	d. 3 rupee.	
Page 106	1. b. Rs 62, Rs 13	c. Rs 80, Rs 10	d. Rs 136, No	
Page 107	1. b. Rs 30	c. Rs 75		
	2. a. 10 stamps	b. 5 pastries	c. 5 tickets	
Page 108	1. a. Rs 56	b. Rs 9	c. Rs 162	d. Rs 180
	e. Rs 8			

Unit 8 Measurement

Page 114	3. b. 93 m	c. 41 m	d. 95 cm	e. 106 cm	f. 75 cm
Page 115	5. b. 28 m	c. 37 cm	d. 92 m	e. 38 m	f. 24 m
Page 123	2. b. 875 g	c. 650 g	d. 107 kg	e. 48 kg	f. 750 g
Page 124	2. a. 60 g	b. brand X, 55 g	c. 4 kg	d. 258 g	
	e. pan, 60 g	f. 19 kg			
Page 130	2. a. 18l	b. 865 l	c. 63 l	d. 750 ml, 775 ml	
Page 131	4. a. 9 l	b. 270 ml	c. 522 l	d. 165 ml	